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EDITORIAL.

EUROPEAN CHRONICLES.

PARIS, April 15, 1911.

PARASITISM AND TUMORS.—Prof. Panisset in the part "Pathological Anatomy" of the *Revue Generale,* has presented a concise review of a report made by Prof. A. Borrel before the International Commission for the Etiology of Cancer:

"Up to the present time it has been possible to transplant indefinitely cancerous tumors, providing the operation was performed on animals of the same species, same breeds and living in conditions as similar as possible. But the cancerous cells have always been indispensable in those operations of transplantation; in fact these were simple graftings and, for this reason, most investigators have left aside the parasitic theory of cancer.

But for Borrel, the experimental cancer of laboratories represents only the second act of the development of the cancerous tumor, the proliferation of the cancerous cells. In spontaneous cases, this proliferation is always preceded with the transformation of the normal into cancerous cells and it is the study of this first act which must throw light upon the etiology of malignant tumors.

In a tumor, in its way of formation, one can very well observe the progressive peripheric transformation of the cells,

marking the surface of the invaded zone by the transformation of the surrounding cells into cancerous. In the cancerous area the two processes of cellular proliferation and of transformation march together; later the proliferation becomes the predominating phenomenon and conceals that of the transformation. To this point of view, the cancerous lesion does not behave differently from the infectious processes known, pustules or tubercles. These observations prove more in favor of some infectious cause, they do not answer very well with a diathesis or embryonic theory. Clinical observations and statistics are as many arguments which speak in the same sense, presence of cancer in some regions and rarity or complete absence in some countries, localizations of some forms, etc. In mice breeding, there are observed a percentage of tumors which are very different or of forms of cancers varying according to the locality.

With others, Borrel has observed that the cancer of mice is rare when the animals were placed in glass jars kept relatively clean and that in wooden boxes left uncleaned purposely, the percentage had increased from year to year from 0.6% to 2 and 9%. The tumors have appeared more frequent in April, May, September and October. But up to this day, it has not been possible to create at will in a selected cage the positive condition of the production of tumors.

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Tumors of mice appear most often in the groin or the axilla, which are the parts of selection for fleas or other biting insects to bite them. At the beginning, the young tumor can be mistaken with cysts, very frequent in the localities or places where breeding is carried on and which occur in the same selected spots. In the cysts and around them, there are always found helminths or cestodes, neighbors of microfilarias. The presence of cysts in mice seems surely, says Borrel, connected with the presence of these helminths.

In the case of adeno-carcinoma, at the onset, Borrel has found several times the same nematod. The same parasite

seems to have given rise to a cyst or a tumor, according to the place where it was lodged or according to the infection that it carries with it. Similar helminths have been found by Gorescu and Borrel on two mice affected with general lymphoma. At the present time Borrel thinks that it would be interesting to admit that such nematods, transported by some pricking insects, are the roots of cancerous infection and perhaps the carriers of some virus or varieties of virus.

Concerning the sarcoma of the liver of rats, it is easier and more justified to incriminate the cysticercus of the Ten. Crassicola. More than fifty observations have been collected in Europe, America and Africa. As there exist many cases of helminthiasis or of cysticercosis, which does not give rise to sarcoma, it is a proof in favor of the thesis advanced by Borrel, that some cysticerci, but not all, are able to carry some virus of cancer. In two occasions, the author has found in the tumor or in the neighborhood of the parasite, microbes of various types.

Sarcomas of the liver can be compared to some parasitic tumors of vegetables and trees and Borrel asks, if larvæ deposited on vegetal structure cannot also be the cause of some microbian infection.

And again, in an epithelial cancer of the omentum of rabbits, observed by Petit, the part played by cysticerci seems to have been made evident by microscopic examination.

Ecto like endo-parasities are able to localize a cancerous infection. In adenomas of the sebaceous glands of mice, an acarian, which has not been recognized, was found. In dogs, in a case of lympho-sarcoma of the vulva, Borrel has been able to connect with it important parts of acarians. The study of cancer of the face in man shows the influence of demodex. In the etiology of cancer, demodex can be compared to the nail puncturing the foot of a horse, in the etiology of tetanus. Alone the microbe of tetanus could not develop in the organism, it had to be introduced by a foreign body into the intimate structure of tissues. Therefore it is necessary that the demodex as well as the cysticercus be infected and be the carrier of a virus to de-

termine epithelial cancers. Foreign bodies of various nature may promote the development of cancer. Borrel has found a needle in the center of a cancer of a pancreas in a dog; a large splinter of vegetal nature in a cancer of the intestine of man. Adjuvants are very varied, radio dermatitis due to Roentgen rays may be transformed in epithelial cancers. The cancerous virus or viruses cannot be inoculated except on a prepared soil and thus is explained why direct inoculations fail.

Borrel believes that pigmentary cells of the epidermis or of the pigmentary type play a part similar to storing cells for cancerous infection. Accumulated and disorganized cells are found in radio dermitis, in epithelial cancers. Their action is certain in melanotic tumors but, to a very general point of view, one may ask if many others tumors, by their own stroma, are not melanotic tumors.

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Artificial Serum and Infectious Diseases.—At first, when salt entered in the treatment of sick animals, far was the thought that it was the inauguration of a therapeutic method, which is now of almost universal application. Chloride of Sodium, common salt, absorbed by animals under the effects of acute infections has almost proved itself as the best means to eliminate the toxic principles existing in the organization.

Those were about the words with which Prof. Cadeac in the *Journal de Zootechnie* opens his general review on the application of artificial serum in the treatment of diseases by intoxication and then continues:

"It is the best curative agent of those intoxications, almost always improving the condition of the animals, that it does not cure. There is no therapeutic agent from which as much could be expected; there is none that keeps so well all that it has promised. It would be useless to enumerate the diseases that it may relieve, as their number is too great; and moreover, the specific action of the Chloride of Sodium does not affect one disease more than another, it acts on all; it does not work on the mi-

crobes, but on their poisons. And after all, is not pathology of infectious diseases resumed in one expression, *intoxication?* As almost all the diseases are governed and kept up by infectious germs, salt becomes the general antidote of their specific poisons.

"The rapid elimination of these poisons diminishes or suppresses the action of the microbes and reduces it to the modest condition of a commensal or a simple vaccinating agent.

"As soon as these poisons cease to interfere, there are no more symptoms, no more lesions, there is no more disease. The plasma is no longer altered, the nutrition of the cells is no more endangered, and normal life resumes its course.

"The recovery in disease is then depending on the rapidity of the elimination of these poisons. If it takes place early, the alterations of the parenchymatous cells and the evolution of the lesions are prevented; if it is late, it is often inefficacious. The toxic elements have disturbed the vital apparatus and given rise to irreparable lesions. Salt can only restrain or limit them. Administer this salt to a dog affected with old paraplegia due to distemper, little change in the condition of the animal will be observed; its recovery is at least problematic. But it becomes certain, if the injections of artificial serum are resorted to at the beginning of this paraplegia. With dogs suffering with paresia or even paralyzed since one or two days only, this medication has a marvelous effect. After a first injection, it is almost a resurrection. The dog gets up, runs, he is cured. Other injections reinforce this almost instantaneous recovery. The animal recuperates its motricity and sensibility as if coming out of a chloroformic sleep or the beginning of an intoxication by a narcotic."

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Having thus examined the advantages obtained by artificial serum, Cadeac reviews the condition of the mode of action of this agent, which has already been given by Prof. Porcher some years ago. It is a question of microbian toxines, which destroys the osmotic equilibrium, by a retention of the chloride. This re-

tention in inflamed organs, as the lungs in pneumonia, the pleura in pleurisies, the subcutaneous connective tissue in œdemas or anasarca, has for effect the retention of a certain quantity of water, which holds the chloride in solution with the biologic and pathologic poisons; then the animal urinates no more, the poisons accumulate in the serum of the blood and impregnate the cells, the inter-cellular and the circumcellular surroundings constitute two *isotonic* solutions, having the same osmotic pressure, and their reciprocal exchanges are merely *one go and come* of the same poisons. It is a permanent toxic equilibrium.

By the accumulation of the products of waste of the tissues and by the concentration of the microbian toxines, the intensity of this equilibrium is increased; the nervous cells degenerate, the dog affected with distemper becomes choreic or paralytic, the hepatic cells undergo granulo-fatty degeneration or a true necrosis, the kidneys lose their filtering properties, the nervous system, the regulator of the tissues' life stops its functions; it is a rapid or a slow death, but nevertheless certain, of the intoxicated subject.

Injections of artificial serum, under the skin, in the veins, or in the rectum overcome this fatal equilibrium in producing a new call for water, which dilutes the poisons accumulated in the blood, in re-establishing an exosmotic current which draws from the cells, the toxines, which impregnate them, raises the bloody tension, reopens the renal functions and at the same time gives rise to a chloruric and a polyuric crisis.

The artificial serum promotes the debacle of the toxines and of the chloride of sodium detained in the tissues.

This expulsion of the chloride, abnormally detained, prevents a new retention of the water necessary to establish the osmotic equilibrium and does not permit the poisons, that it holds in solution, to remain in it. This *washing* of the organism is most beneficial in all infectious diseases without exception. Now, what are the indications? In *solipeds*? It must be used in pneumonias, in all the typhoid diseases, in pleurisies, in purpuras, in intestinal occlusions, in metritis. In *cattle,* it is the

best treatment for gangrenous coryza, in uterine and mammary infections. In *dogs,* in simple jaundice, piroplasma, in all forms of youth diseases (distemper). Tested with some success in some dermatitis of man, it may be advantageous to resort to it in veterinary medicine in cases where the disease has proved rebellious to usual therapeutic means.

It must, however, be remembered that this excellent mode of treatment, if used, must be resorted to at once, not to wait until the disease has gone through all its stages. It is not a remedy of the last hour, it is efficacious in the entire duration of the disease providing it is not used parsimoniously or in such small doses that it has no effect. Whatever contraindications or objections have been made against its application in human medicine, they have no value in veterinary medicine.

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RADIO-ACTIVE MUDS—THEIR THERAPEUTIC APPLICATIONS. —In connection with a series of lectures relating to the therapeutic action of *radium* to which I have alluded in a previous chronicle, one was delivered which offered a more important and possibly more practical interest; it was the one which took the above title as that of the subject and which at the same time treated principally of radio-active muds, which have received the name of *actiniferous* from their specific nature.

This lecture that Prof. Adjunct Doctor Oscar Claude has published in the *Archives Generales de Medicine* and the excellent paper that Prof. G. Petit, of Alfort, has presented before the Societe Centrale will permit me to present our readers, not only points of interest and generalities upon the muds, but also their application in therapeutics.

Actiniferous radio-active muds are the industrial waste of certain minerals of Urane (oxide of Uranium), which have been considered for a long time as useless, but which nevertheless are powerfully radio-active, containing quite an appreciable quantity of radium, polonium, and principally of actinium, from which their name is derived.

The constant presence of actinium in those muds is most important, as it is to it that their radio-activity is due, and one must know that this property exists in actinium in quantity considerably superior to that possessed of by Radium itself. Leaving aside the initial analysis made of these muds, I will merely say that their composition is most complex, containing iron, aluminium, uranium, magnesium, sodium and calcium.

These muds consist of a soft, reddish paste, generally very homogeneous, of butter or soft clay consistency, which permits their direct application as plasters, or in suspension in water, as baths, general or local. Petit, who has experimented with them, remarks that they have great astringent properties and that on that account, to avoid their tanning hardening effects on the skin. comparable to that of formol, it is better to resort to a spoon or spatula in manipulating them.

Actiniferous radio-active muds have been compared to the natural muds as they are found in some mineral thermal watering establishments. But the action of the former is very different. They have permanent radio-active properties, they are *permanent* radio-active muds, while with the thermal products these properties are lost as the "emanation" from the Radium soon itself rapidly passes away. Thermal muds transported from their original ground lose their properties rapidly and become inactive, actiniferous do not. And while their radio-activity is, it is true very weak, and varies with the samples of muds, it is nevertheless lasting and continues; new emanation being always added by the presence of the radio-active elements which they contain and continuously produce.

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Pertaining to the class of radio-active elements such as the Radium, it was indicated that actiniferous muds should also be tested in relation to their therapeutic qualities. Dr. Claude was the first who utilized them in human medicine and he has related the successful results he has obtained with them in the

treatment of rheumatisms, arthropathies of various nature in some diseases of the skin and also of the nervous system. The example given by the doctor has been followed by others and several indications have presented themselves where in the practice of others satisfactory results were also recorded.

It was interesting to find out to what extent veterinary medicine could also be benefited by the use of permanent radio-active muds. Prof. Petit who since months has made a special study of the subject, has also obtained excellent results with dogs affected with generalized eczema which were treated with some twenty baths and recovered. In rheumatisms, in adynamic condition of animals, to stimulate their vital energy, activate their convalescence or to treat various chronic infections of different severity, in all Petit can record encouraging results.

With horses, either in baths or local applications, Petit has tried actiniferous muds in arthropathies, sprains, lymphangitis, common scratches, etc., and he seems to have great faith in the good that such treatment might give. Two cases of lymphangitis and one chronic thickening of an extremity were also successfully relieved with mud applications.

We are promised detailed records of several more cases with similar results.

The technique of the indications are simple. For baths or lotions, prepare them with 150 or 200 grammes of mud in water at 37° C. The bath can be used several times by the addition of a small quantity of fresh mud not used. For plasters, delay the mud in a little glycerine. If the surface of the skin is too large, treat it in sections say by half, in two seatings. For skin disease generalized, for instance, treat one side of the animal and afterwards the other. When the anatomical configuration of the animal allows it, rub a thick coat of mud over, put on an impermeable sheet over it and apply a moist bandage firmly secured with pins. If the anatomical shape prevents this dressing, the mud is mixed with glycerine and applied over the parts only; the glycerine being to avoid a too rapid desiccation. Baths or lotions are better in such cases.

It is sure that the introduction of this treatment with actiniferous radio-active muds in veterinary medicine is a new thing and that for the present it would be difficult to say what future is reserved to it. But Prof. Petit and those with whom he is now experimenting will no doubt at an early date bring before the profession facts which will speak for themselves and will be conclusive. As it is, let those who may have the opportunities try this new treatment.

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MYDRIASIS AND MYOSIS.—In ophthalmology, for some inflammations of given structure, it is often recommended to use alternatively mydriatics and myotics, so as to act upon the iris and prevent the definite formation of synechia, which have for result to immobilize it. Most generally mydriasis is obtained with the sulphate of atropine, and the salicylate of eserine is used as myotic.

However, reports Prof. Porcher, before the Societe des Sciences Veterinaires of Lyon, "If the experiment is made to test the antagonism of these two alkaloids, one readily sees that atropine does remove the eserinic myosis but that eserine has no effect on the atropinic mydriasis." Opinions, however, are contradictory. And Porcher has experimented on the question using eserine as myosis and as mydriatic, atropine and afterwards cocaine and he has found that atropine produces a strong and lasting mydriasis upon which eserine has no action; but if the atropinic mydriasis has existed for a few days, the action of atropine beginning to lose its strength, the instillation of a strong solution of salicylate of eserine is followed by myosis, which may disappear because the effects of atropine, not being entirely gone are yet acting. Therefore one must not depend on eserine to overcome with certainty an atropinic mydriasis in full development. However, if cocaine is used as mydriatic the result is different. The effects of cocaine are not as strong as those of atropine and the iris remains still under the influence of light. If mydriasis is obtained, not by the instillation of strong dose of

cocaine, but by a subcutaneous injection as Porcher has done it in dogs, rabbits and horses, the two pupils are simultaneously affected and the mydriasis is well marked, and almost as strong and lasting in dogs and rabbits at least, as with atropine mydriasis.

Then the instillation of eserine in one eye only gives rise to myosis in that eye, as clearly and rapidly as if the iris was not under the influence of cocaine and the myosis remains. Therefore eserine suppresses without return mydriasis with cocaine. To these remarks Prof. Maignon added some explanation of physiological nature.

The alternate use of atropine and eserine with the object of moving the pupil and avoid adhesions between the iris and the crystalline lens is more theoretical than real. In practice, one or the other is employed; atropine in cases of internal diseases of the eye, and eserine in wounds of the superficial membranes of that organ. In this last condition, atropine must be left aside because of the hypertension it produces in the ocular media, which interferes with cicatrization. Eserine that reduces intra-ocular tension is to be preferred.

Atropine produces mydriasis in paralyzing the terminations of the common oculo-motor nerve in the sphincter muscle of the iris. The tonicity of the organ being removed, the pupil dilates. Eserine acts in a very different manner. It renders all anatomic elements inert, it is a coagulating agent of all protoplasms. With atropine the dilation of the pupil is the essential phenomenon with cocaine the result is far off. The mechanism of action of the two alkaloids is essentially different.

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INTRA-TRACHEAL SPRAY.—Years ago Dr. Levi, of Pisa, became the pioneer of the treatment of pulmonary diseases by intra-tracheal injections of medicamentous solutions, convinced as he was that it would realize a progress in the treatment of the diseases of the respiratory apparatus, which heretofore have been and are yet treated only by indirect ways.

The proposition advanced by Dr. Levi gave occasion to many investigations from others and Barner having demonstrated that the liquids injected in the trachea did not in any case go beyond the first bronchial ramifications and the base of the anterior pulmonary lobe, the theory and hopes based on Dr. Levi's method were soon given up.

Yet the idea was not abandoned altogether and other experiments were started. Fumigations and inhalations have not given any satisfactory results, it is true, but when the drugs are used in solution and applied with a spray, the results seem to be different. The *Deutsche Tierärztliche Woch* has published the experiments made by veterinarian Albert Wosshage under the direction of Prof. Malkmus of Hanover. A "Spray Apparat" is the instrument used. It is a kind of vaporizer, atomizer, to which are adapted a strong bellows and a trocar with a special curve. The trocar is introduced into the trachea between two cartilages after incision of the skin, which is made to prevent the displacement of the canula and facilitate the introduction of the instrument.

The experiment had for its object to find out: (a) How would the pulverized liquid thrown by the spray apparatus act on reaching the lungs; (b) How would healthy animals behave when submitted to experiments made with several kinds of medicamentous sprays? The results obtained so far are encouraging and can be resumed as follows:

1.—Liquids pulverized in the trachea with the Spray-Apparat are immediately resorbed by healthy lungs; therefore it is possible to irrigate the whole alveolar surface at the same time as the trachea, larynx and pharynx. The efficacy of the pulverization depends on the duration of the operation, the minuteness of the spray, the quantity of the liquid used and the strength of the inspiration of the animal, which can be increased by closing alternately and more or less the nostrils of the animal.

In relation to the minuteness of the spray, oily solutions are considered as the best and preferable to others. Then come the glycerinated and lastly the alcoholic and the aqueous.

2.—Healthy animals stand very well the spray of the various medicamentous solutions. They rarely have, during the operation, spells of coughing.

The quantity of liquid to use varies between 60 and 100 grammes. The dose of the drugs primitively indicated by Levi and others as being fixed to the 10th or 20th of the therapeutic dose per mouth, is sufficient, as part of the liquid is swallowed during the operation.

The very simple technic of the atomizer of Malkmus makes it certainly a new mode of treatment for diseases of trachea, larynx and pharynx and it will be soon definitely adopted for those affections of the bronchia and of the lungs also, where it is said, it will be called to render great services.

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BIBLIOGRAPHIC ITEMS.—The second part of Vol. IV. of the transactions of the Ninth International Veterinary Congress at The Hague is published. It contains the discussions of the meetings of the various sections. This closes the publications of the work done at the Congress. In the preface of the present volume, Dr. A. De Jong, General Secretary, pays a gracious souvenir to the memory of the late Dr. Leonard Pearson, member of the permanent Commission of the International Veterinary Congresses. "Those who had the opportunity of knowing and seeing our benevolent learned American colleague and who remember what excellent support his presence was for the Congress of Budapest will understand that our congresses and the permanent Commission have lost in him one of their most worthy members."

Such remarks coming from the pen of one of the most prominent veterinarians in Europe will be fully appreciated by all who have known and learned to love the departed Professor and Director of the Veterinary Department of the University of Pennsylvania.

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The *Archives Générales de Médicine* have reserved one of their numbers to the series of lectures delivered relating to radium in its various applications in medicine.

Those who are interested in the subject will do well to provide themselves with the July number, 1909, of this valuable journal.

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The No. 1 of the 16th volume of the *Archives of Biological Sciences,* published by the Imperial Institute of Experimental Medicine at St. Petersburg is also at hand. It contains four interesting articles: The *chemical processes of fermentation in Koumiss and Kephir* with illustrations, The *influence of functional rest in the evolution of tuberculous process in the lung,* The *processes of oxidation and their influences on the extracts of Horse-radish* (Raphanus Sativa); *Septic tanks as destroyers of organic substances in sewers.*

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The *Agricultural Journal* of the *Union of South Africa* has made its appearance. It is to take the place of that of the Cape, *Natal and Transvaal,* published by the Department of Agriculture at Pretoria, and at a nominal price; it is a monthly which is called to do much work. The first number among its veterinary matters of importance contains an article on *Stiff Sickness* or *Stijfziete* in Cattle, by Dr. Arnold Teiler, the Acting Director of Veterinary Researches, which as conclusions says: "1. The disease *stiff sickness* in cattle resembles in all respects laminitis in horses. In fact it may be called laminitis of cattle. 2. The experiments undertaken at two different places show that *Grotalaria Burkenna* is the cause of stiff-sickness."

In this number there is again from Mr. J. M. Christy, Assistant Principal Veterinary Surgeon of Transvaal an article illustrating the means of control of farm stock and from Mr. Thomas H. Dale, M.R.C.V.S., one on Heredity which is illustrated with photos of Zebras and Hybrids of great interest.

—A. L.

THE GREAT TORONTO MEETING.

In less than a hundred days the great Toronto meeting of the American Veterinary Medical Association will be at hand; and present indications point toward the fact that it will not only be great, but greater than on any previous occasion. We published a part of the literary program in our May issue, and hoped at that time to be able to pubish in the present issue the titles and authors of the papers of some of the other divisions, together with an outline of the general program, but find we were crowding the local committee a little faster than they were able to arrange the many details that go to make up a program of so great a gathering; a fact which emphasizes more strongly than anything else, the magnitude of the convention that the American veterinary profession is looking forward to in August next. We are assured by Secretary Marshall, however, that we will be in possession of the necessary data in sufficient time to publish a complete program in the July issue of the REVIEW, which will be sufficiently early to permit the profession throughout the entire country to arrange to be a part of this great congress of veterinarians.

Under the head of correspondence on page 346 of the present issue, President Glover has addressed the "Resident State Secretaries" on the work that he anticipates they are doing in regard to securing applications for membership to be presented at the coming meeting. We are glad to be able to assure President Glover that the "boys" are hard at work and will not disappoint him; as we have had the pleasure of reading three circular letters issued on April 8th and May 6th, by probably the youngest state secretary among his appointments, if not the youngest one who has ever been honored with that important office, Dr. H. Preston Hoskins, of the great state of Pennsylvania. Dr. Hoskins on the above dates, in view of the fact that the convention will be held in Toronto, sent a letter to all eligible Ontario graduates in his state, calling their attention to the fact that the A. V. M. A. will convene this year in the home of their Alma Mater and urg-

ing them to file an application for membership so as to be elected there. He issued another letter on the same date to all Pennsylvania veterinarians who are already members, urging them in view of President Glover's expressed desire to double the membership of the A. V. M. A. this year, to secure one new member each as their share in the work toward that end. On May 6th the doctor issued a third letter, addressed to *all* eligible veterinarians in his state who are not members of the A. V. M. A. not covered by his Ontario graduate letter, urging upon them the great advantages to be derived from membership in the national organization. Each of Dr. Hoskins three letters is strong and argumentative, and surely will be productive of much good to the American Veterinary Medical Association and consequently to the American veterinary profession. The REVIEW, therefore, feels assured by this sample of the work being done by this *youngest* resident state secretary, that President Glover's aids will not disappoint him, but will, on the contrary, overwhelm him with their accomplishments.

Another movement to strengthen the hands of the president of the A. V. M. A. was started by the B. A. I. Veterinary Inspectors' Association of Chicago, at its May meeting, in the passage of a resolution by that organization, indorsing the movement inaugurated by President Glover for uniformity in veterinary degrees and instructing their delegate to the national organization to convey the action taken, to that body. We believe with Dr. H. D. Paxon, whose correspondence on this matter appears on page 349, that it would be a good move for all local organizations to take similar action.

EXAMINATION FOR VETERINARY INSPECTOR.—The United States Civil Service Commission announces the postponement to July 5, 1911, the examination announced to be held on May 24, 1911, for the position of veterinary inspector in the B. A. I. at $1,400 per annum. Applicants should at once apply to the United States Civil Service Commission, Washington, D. C.

ORIGINAL ARTICLES.

ARSENICAL POISONING FROM SMELTER SMOKE IN THE DEER LODGE VALLEY, MONTANA.

By D. E. Salmon, D. V. M.

II.

The Presumptive Evidence of Arsenical Poisoning.

POISONING ADMITTED IN 1902.

It is hardly necessary to refer to the well-established facts of arsenical poisoning from the fumes of smelters in European countries, more especially in England and Germany, as presumptive evidence of poisoning in the Deer Lodge Valley. These, however, have some bearing as showing that copper ores are liable to contain arsenic, that this arsenic is volatilized and escapes with the smoke, and finally that it may be condensed and deposited upon the grass and forage growing or standing in the neighboring fields, in quantities sufficient to poison the farm animals.

In the case of the Washoe Smelter, there is the much more direct evidence furnished by the admitted poisoning which occurred in the year 1902, almost immediately after the beginning of smelting operations at the site now occupied. The admission of this poisoning carries with it the admission that arsenic exists in the ore smelted at Anaconda, and that it escapes in large quantities with the smoke.

The modification of the smelter by the construction of settling chambers and dust flues to cause the deposition of the arsenic before it enters the chimney; the building of an enormous stack on the mountain side, far above the level of the furnaces, with the alleged object of discharging the smoke into the atmosphere at as high an elevation as possible, so that it would be-

come widely disseminated and diluted before coming in contact with the soil of the valley; and, finally, the construction of an arsenic plant with a capacity of thirty tons, constitute undeniable evidence of the poisonous nature of the smoke and of the fact that this was known to and admitted by the company.

The questions which are to be asked, therefore, in this connection, are not whether the ores smelted at Anaconda and the smoke escaping from the smelter contain arsenic in large quantities, for this much is admitted; but they are whether the settling chambers, dust flues and arsenic plant materially decreased the quantity of arsenic discharged into the atmosphere, and whether the high stack caused the smoke to be so disseminated that the discharged arsenic was no longer deposited in injurious quantities upon the fields of the valley.

THE INFLUENCE OF THE BIG STACK.

A few weeks' observation of the course of the smoke after it leaves the top of the big stack is sufficient to demonstrate that the object of discharging it at so great a height that it would be widely disseminated and diluted before coming into contact with the vegetation of the valley was not accomplished, or, at the best, only partially accomplished. On certain days when the atmosphere is in a favorable condition the smoke rises and is quite thoroughly dissipated high in the atmosphere; but on other days the currents of air bring it down to the ground so that it strikes the nearest farms and spreads over the valley like a fog for fifteen or twenty miles. Undoubtedly, there is greater dissemination with the high stack than there was with the short stacks, but just as surely the smoke still frequently strikes the nearest parts of the valley in great concentration and drifts along the surface of the ground for many miles.

Judge Hunt, although only two days in the valley, did not fail to observe these conditions. He says: "Upon the first day, which was bright, the smoke from the big stack rose high into the air, and seemed to be carried far away, so high that its diffusion would seem to have been too general to do injury to any

land; but on the second day, the weather was rainy, and the clouds were lower. The smoke then was more dense, and its stream was carried down toward the Bliss ranch, and southerly and northerly for a few miles toward the centre of the floor of the valley, and was there dissipated."[1]

The writer has frequently seen the smoke for days at a time strike the floor of the valley near the smelter and spread over the farms, carried by the currents of air sometimes across the southern end of the valley towards Butte, sometimes down the valley near its centre, and sometimes along the eastern or western range of mountains and covering a strip of the valley one or two miles wide. In the summer of 1906, he saw it for weeks at a time drop into the Mill Creek Valley or take a southerly direction across the mountains, and only at rare and short intervals go northwards over the Deer Lodge Valley.

The obvious conclusion from these observations is that the air-currents and the conditions of the atmosphere about the smelter are variable; that even when the short stacks were used the smoke did not constantly spread over the Deer Lodge Valley, but much of the time must have drifted in other directions and sometimes ascended to a great height; that notwithstanding the height of the new stack the smoke still frequently drops abruptly into the valley and spreads out in such a manner as to deposit its contents as completely as it could have done when the short stacks were in use. It is, therefore, impossible to conclude from a study of the course of the smoke as it is discharged at present, that there could be such a difference in the time (*i. e.*, the average number of hours per month) it was over the valley when the short stacks were used and the time it is over it since the construction of the big stack, or such a change in the areas over which it was diffused, as to change the effects from general and acute poisoning in 1902 to absolute harmlessness in 1905 and 1906.

Considering for the moment, then, only the influence of this new stack on the smoke conditions, the presumption is that as poisoning occurred before it was constructed, it continued to

occur afterwards, and the claim that it does not occur at present, in order to be accepted, must be based upon some more tangible evidence of the dispersive action of the new stack, or upon some modification other than the change of stacks.

THE INFLUENCE OF THE DUST CHAMBERS AND FLUES.

A large quantity of dust, rich in arsenic and copper, is deposited in the settling chambers and flues. The highest percentage of copper is found nearest to the furnace and the highest of arsenic nearest to the bottom of the stack. The analyses of Harkins and Swain show the composition of the dust to be as follows:[2]

	Copper Per Cent.	Arsenic Trioxide Per Cent.
Sample from near foot of stack.....	4.64	26.06
Sample from bottom of narrow flue.....	8.00	7.14

Judge Hunt says the portion of dust which is high, about ninety per cent., in arsenic goes to the arsenic plant, and as much as two tons a day is collected and sold for commercial purposes. The portion of the dust not treated for arsenic, approximately 160 tons daily goes directly back to the reverberatory smelting furnaces and is treated for the extraction of copper, silver and gold.[3] That is, about 2¼ tons, or approximately one and one-half per cent. of the total amount of dust deposited is used for the manufacture of arsenic. The remainder of the dust is sent to the reverberatories and smelted, so that the arsenic which it contains must in the end be discharged with the smoke, excepting only that portion which goes into the reverberatory slag.[4]

As a matter of fact, therefore, with the exception of that portion of the dust used at the arsenic plant, the deposition of this enormous quantity of dust in the settling chambers and flues has practically no effect on the quantity of arsenic which escapes with the smoke. The benefit which is derived from this system of chambers and flues consists in the saving of copper, silver and gold to increase the earnings of the plant.

It is to be noted, however, that according to Harkins and Swain, dust collected from the outside of the glass sampling tube in the stack gave 25.7 per cent., and dust which dropped from the top of the stack 25.6 per cent. of soluble arsenic, calculated as trioxide. They estimate the quantity of flue dust at approximately fifty tons daily.[5] These discrepancies, however, do not affect the conclusion just reached as to the influence of the flues and dust chambers on the escape of arsenic with the smoke.

THE INFLUENCE OF THE ARSENIC PLANT.

It has already been shown that according to the claim of the smelter company a sufficient quantity of flue dust is treated in the arsenic plant to remove a maximum of two tons of arsenic trioxide per day. To get an idea of the effect of extracting this quantity of arsenic from the smoke, it is necessary to know approximately the total quantity which would go into the smoke if these two tons were not collected. To ascertain this quantity has been one of the most difficult problems connected with the case.

Harkins and Swain calculated the escape of arsenic from data obtained by analyzing samples of the smoke and determining the number of cubic feet discharged per day. To accomplish this they measured the velocity of the smoke in the stack by introducing a Pitot tube through the five-foot wall at a height of fifty-three feet above the base of the stack and withdrew samples of smoke for analysis from the same opening. The average of their determinations gave three and one-half billion cubic feet of smoke per day containing 59,270 pounds of arsenic trioxide.[6] This is considerably more than a ton of arsenic per hour.

The reliability of these determinations was questioned on the theory that it was impossible to carry out these experiments without introducing some errors, and that the slightest mistake in the chemical analysis in trying to arrive at the amount of arsenic would be multiplied by millions and millions. It seems to the writer that a sufficient answer to this objection is furnished

by a comparison of the many determinations of velocity and of the different determinations of the quantity of arsenic. If errors were made and multiplied by millions and millions, there could not be a close correspondence in the results of the different determinations; and as there was a close correspondence with no greater variation than would probably occur in the actual volume and content of the smoke from hour to hour or from day to day, it is logical to conclude that errors of importance were avoided.

Haywood attempted to estimate the quantity of arsenic by analyzing the ores from the mines which supply the smelter. His results vary from zero in the ore from one mine to 12.95 per cent. in the highest sample from another mine. Rejecting this highest determination as exceptional, his average of all the ores was 0.85 per cent. of arsenic. With an average of 8,000 tons of ore smelted per day, the quantity of arsenic going into the plant per day would be sixty-eight tons, and this has only three channels of escape, viz., (1) the smoke, (2) the arsenic plant, (3) the tailings and slag. Analyses of samples from the dump gave an average of 0.09 per cent. of arsenic. It is evident, he says, that the amount found in the dump can not account for the sixty-six tons of arsenic that go to waste; hence a considerable quantity must be volatilized.[7]

For the writer, these analyses of Haywood are a remarkable confirmation of the work of Harkins and Swain and indicate that if they committed an error it consisted in underestimating, rather than in overestimating, the quantity of arsenic volatilized. Admitted the intake of arsenic to be sixty-eight tons, if two tons are collected in the arsenic plant and thirty tons escape in the smoke, there remain thirty-six tons to go into the tailings and slag; and if this waste contains no more than 0.09 per cent. of arsenic, it would require 40,000 tons to account for the surplus arsenic. As this is five times the quantity of ore which is supposed to go into the smelter, it is difficult to see how so much arsenic escapes by this channel.

Mr. E. P. Mathewson, general manager of the Anaconda Copper Mining Company, is reported to have submitted a state-

ment declaring that the estimates of Harkins and Swain are misleading, and that the measurements made by the company indicate that only about ten tons of arsenic escape in the smoke per day.[8]

From all of these determinations, it seems reasonable to assume that the quantity of arsenic which escapes in the smoke per day certainly reaches ten tons, and it may reach thirty tons. Even if we accept the figures of the smelter company, it does not seem probable that a reduction of the quantity of arsenic escaping in the smoke from twelve tons before the modification of the smelter to ten tons afterwards would be sufficient to insure absolute freedom from intoxication where there had been general and acute poisoning before. To accept such a conclusion would be equivalent to saying that when doses of thirty-six grains kill an animal by acute poisoning, thirty grains may be given daily for an indefinite time without injury.

The discharge of even ten tons of arsenic per day into the atmosphere, from a plant on the margin of an inhabited valley, can hardly be regarded as other than a matter for grave apprehension, and if it were not for the fact that the currents of air frequently change and that much of the time the smoke goes away from the valley, it is difficult to understand how any grass-eating animal could escape acute poisoning.

Let us attempt by a simple calculation to get an idea of what the daily discharge of ten tons of arsenic into the atmosphere really means if it is all deposited within twenty miles. Assuming the smoke zone to be comprised within a circle having a diameter of forty miles, the smelter being at the centre, this zone would contain 1,256.6 square miles or 804,224 acres. The uniform distribution of ten tons of arsenic over this area would give 174 grains to the acre. If a crop of grass is exposed to this rate of deposition for forty days during its growth, there would be deposited upon it in this time 6,960 grains per acre, or supposing it to cut two tons to the acre, 3,480 grains per ton. This would be equivalent to forty-three and one-half grains for every ration of twenty-five pounds.

It is not the writer's intention, in this connection, to claim that all of the arsenic is deposited within a radius of twenty miles, or that all that is deposited would adhere to the hay, but simply to show the relation of the quantity of arsenic which certainly escapes, to the area of the admitted smoke zone.

As a matter of fact, the arsenic is not uniformly distributed daily, but often for days or weeks at a time the smoke stream follows nearly the same course, and this course is very frequently along the valleys. If we admit that the smoke stream, as it drifts down the Deer Lodge Valley, is two miles wide and twenty miles long, it must deposit its arsenic over forty square miles, or 25,600 acres. The quantity of arsenic which it would carry in twenty-four hours is sufficient to give 5,460 grains to each acre, or, on the basis of our previous calculation, 34.5 grains for each ration of twenty-five pounds of hay.

In this calculation, the quantity of arsenic admitted by the company to escape with the smoke is taken as a basis, and while it is not certain that all of the arsenic would be deposited within twenty miles, even when the smoke drifts very close to the ground, neither is it certain that it would not all be deposited within that distance. The fact that arsenic is found on the vegetation at a greater distance may simply indicate that it is carried further when it follows a course very high in the atmosphere. However, the purpose of the calculation just made is not to show the exact quantity of arsenic deposited upon the hay or grass, but to establish the fact that, notwithstanding the operation of the arsenic plant, the quantity carried by the smoke is still so great, with relation to the area to which it may confine itself for several hours or even days at a time, that it furnishes strong presumptive evidence that live stock feeding upon the hay or grass thus exposed would be injuriously affected.

THE ARSENIC CONTENT OF THE FORAGE AS DETERMINED BY CHEMICAL ANALYSIS.

What has been said above with reference to the deposition of arsenic on grass and hay may be objected to on various grounds

if unconfirmed by direct proofs, since it might be urged with an appearance of reason that much of this poison is carried a great deal farther than twenty miles. While, therefore, the estimates which have been given are regarded by the writer as having great weight as presumptive evidence, and also as confirming and explaining the results of chemical analysis, they must be supplemented by the actual analyses of the contaminated products. Fortunately, we have the results of such analyses made by Swain and Harkins, and, independently, by J. K. Haywood, chief of the Miscellaneous Laboratory of the Bureau of Chemistry of the United States Department of Agriculture.

In order that the results may be more readily compared, the findings in Haywood's table have been changed from milligrams per gram to parts per million, by shifting the decimal point three places to the right, and in the table showing Swain and Harkins' results a column has been added giving the quantity per ration of twenty-five pounds. There still remains the slight and comparatively unimportant difference in the conditions that one table is calculated on an air dry basis and the other as absolutely dry. These results are seen in the following tables:

Table Showing Results of Analyses by Swain and Harkins of Grass, Hay and Other Vegetable Substances from the Deer Lodge Valley and Vicinity, 1905-6-7.[9]

Number of Sample	Description of Sample.	Distance (Miles) and Direction From Smelter.	Arsenic Trioxide.	
			Parts Per Million.	Grains Per 25 Pounds of Air Dry Ration.
1905.				
10	Grass	3.0 N	122	21.3
11	Grass	5.0 E	100	17.5
12	Grass	5.0 ESE	90	15.7
13	Grass	2.0 SSE	79	13.8
14	Grass	4.0 SE	50	8.7
15	Hay	2.0 SSE	23	4.0
16	Grass	2.5 SW	87	15.2
17	Grass	4.0 ESE	68	11.9
18	Hay	3.0 SE	8	1.4
19	Grass	6.0 NE	170	29.7
20	Hay	4.2 NE	85	14.9
21	Hay	3.0 NE	96	16.8

Number of Sample	Description of Sample.	Distance (Miles) and Direction From Smelter.	Arsenic Trioxide: Parts Per Million.	Arsenic Trioxide: Grains per 25 Pounds of Air Dry Ration.
1905.				
22	Grass	3.0 N	77	13.5
23	Grass	2.0 N	220	38.5
24	Grass	4.5 N	217	38.0
25	Hay	4.0 SE	22	3.8
26	Hay	4.0 SE	21	3.7
27	Hay	5.0 ESE	50	8.7
28	Grass	6.0 N	30	5.2
29	Grass	5.0 N	263	46.0
30	Grass	35.0 N	35	6.1
31	Hay	4.5 N	89	15.6
32	Grass	6.0 N	67	11.7
33	Hay	12.0 NNE	35	6.1
34	Hay	2.0 W	15	2.6
35	Hay	14.0 NNE	34	5.9
36	Grass	6.0 N	61	10.6
37	Leaves of trees	0.5 W	427	....
1906.				
38	Grass	5.0 SE	140	24.5
39	Grass	5.5 N	180	31.5
40	Hay	3.0 W	14	2.4
41	Grass	4.0 W	99	17.3
42	Hay	3.0 E	107	18.7
43	Hay	4.0 E	18	3.1
44	Grass	4.2 N	12	2.1
45	Grass	8.0 NNE	111	19.4
46	Grass	5.0 W	38	6.6
47	Grass	3.0 SE	21	3.7
48	Grass	1.5 SW	157	27.5
49	Grass	2.0 S	10	1.7
50	Grass	2.0 SW	359	62.8
51	Grass	1.5 SW	460	80.5
52	Grass	1.7 SW	293	51.3
53	Leaves of lily-of-the-valley	1.7 SW	583	....
54	Bark of trees	1.5 SW	350	....
55	Bark of trees	1.7 SW	376	....
56	Grass	6.0 N	18	3.1
57	Leaves of the cedar	2.0 SW	508	....
58	Grass	0.7 SW	431	75.4
59	Hay	6.0 E	31	5.4
60	Bark of Trees	1.5 SW	300	....
61	Leaves of lily-of-the-valley	1.7 SW	683	....
62	Grass	1.7 SW	482	84.3
63	Grass	2.5 NW	81	14.2
64	Grass	2.5 SW	100	17.5
65	Grass	6.0 N	33	5.8
66	Grass	4.2 N	34	5.9
67	Grass	1.0 N	101	17.7
68	Grass	1.0 E	236	41.3
69	Grass	10.0 SW	64	11.2
70	Grass	13.0 SW	38	6.6

Number of Sample	Description of Sample.	Distance (Miles) and Direction From Smelter.	Arsenic Trioxide. Parts Per Million.	Arsenic Trioxide. Grains Per 25 Pounds of Air Dry Ration.
1906.				
71	Grass	35.0 N	29	5.1
72	Grass	34.0 N	21	3.7
73	Grass	4.2 NNE	121	21.2
74	Grass	6.0 NNE	73	12.8
75	Grass	1.5 E	705	123.4
1907.				
76	Grass	1.0 NE	265	46.4
77	Grass	2.0 SE	97	17.0
78	Grass	3.0 SSE	51	9.0
79	Grass	4.0 SE	86	15.0
80	Grass	4.0 SE	76	13.3
81	Grass	6.0 SSE	47	8.2
82	Grass	6.5 SE	98	17.1
83	Grass	8.0 SE	79	13.8
84	Grass	100.0 NW	00	0.0
85	Grass	75.0 W	00	0.0
86	Grass	100.0 NW	00	0.0

Table Showing Results of Analyses by J. K. Haywood of Grass and Hay from the Deer Lodge Valley and Vicinity, 1906 and 1907.[10]

Number of Sample	Description of Sample.	Distance (Miles) and Direction From Smelter.	Arsenious Oxide. Parts Per Million of Dry Sample.	Arsenious Oxide. Grains Per 25 Pounds of Dry Ration.
4106	Alfalfa	2.5 N	69	12.1
4107	Red top	4.0 NE	28	4.9
4108	Red top	5.0 NE	55	9.6
4109	Alfalfa	10.0 NE	70	12.3
4110	Field grass	6.0 E	55	9.6
4111	Hay	6.0 E	41	7.2
4112	Bunch grass	3.0 E	42	7.4
4113	Bunch grass	6.5 W	55	9.6
4114	Bunch grass	2.0 N	103	18.0
4115	Pasture grass	3.0 N	69	12.1
4116	Pasture grass	4.0 N	41	7.2
4117	Range grass	3.0 N	54	9.5
4118	Clover	4.0 NE	54	9.5
4119	Range grass	4.0 NE	90	15.8
4120	Alfalfa and clover	4.5 NE	54	9.5
4121	Range grass	5.0 NE	90	15.8
4122	Range grass	6.0 NE	104	18.2
4123	Range grass	8.0 NE	55	9.6
4124	Red top	1.0 SE	69	12.1
4125	Range grass	4.0 W	55	9.6

All of the samples included in these two tables were taken after January 1, 1905, and, therefore, they confirm the calculations already made by the writer in this article from which it is concluded that, notwithstanding the modifications to the smelter introduced in 1903, there are still large quantities of arsenic deposited upon the grass in what is known as the smoke zone. It is easily seen from the tables that the quantity of arsenic does not bear a constant, or even a general, relation to the distance from the smelter. The factor of distance has some bearing, but it is overshadowed by the influence (1) of the direction of the air currents, and (2) by the length of time the grass has been exposed.

The influence of air currents and time of exposure were clearly demonstrated by the observations of Swain and Harkins. They say:

"Moreover, above everything else the length of time the plant is exposed to the free atmosphere in the smelting district is the determining factor in connection with its arsenic content. A few cases illustrating this have already been cited in connection with some of the earlier results, and many others could be selected. Nos. 53 and 61, samples of wild lily of the valley, were collected by one of us from the same spot, about one and three-quarter miles from the smokestack and in a section over which the smoke blows much of the time in the summer months. The first one was cut July 3 and the other August 14, or six weeks later. During this time the arsenic content of the plants increased from 583 to 682 parts per million. At the same time these were taken a kind of wild grass (*agripirons divergens*) growing at the same place was sampled. These are designated as Nos. 49 and 62. When the first of these was collected the grass was already dead, so the increase in arsenic trioxide from 293 to 482 parts per million cannot be ascribed to processes of aborption from the soil. Nos. 44, 66, 73 are meadow grass samples taken from the same field in the months of July, Sep-

tember and November, respectively. The July sample, covering the period of most rapid growth and most frequent rainfall, carried twelve parts of arsenic trioxide per million. The September sample more than covered the rest of the growing period and carried thirty-four parts, while the November sample carried 121 parts per million, thus collecting an added eighty-seven parts after all growth had ceased.

"A striking proof that the arsenic is deposited from the smoke was found by a study of the wind currents. The Mill Valley district, southwest of the smelter is the one toward which the smoke blows most during the early summer, while late in August the air currents begin to go northward down the Deer Lodge Valley, and from this time until the snow covers the ground the greater part of the smoke blows in this direction. The analyses show that the grass of Mill Valley contains more arsenic than any other district during the early summer. Thus, samples 48, 50, 51, 52, 53 and 58, which were gathered in July, 1906, contained respectively 157, 359, 460, 293, 583 and 431 parts of arsenic trioxide per million. North of the smelter, sample 12, taken in July, 1906, from the Bliss ranch, contained eighteen parts; one taken in September, thirty-three parts, and one taken in November, seventy-three parts of trioxide per million. In 1905 the Bliss grass, in June, contained sixty-seven parts; in September, sixty-one parts, and in February, 1906 (grass of the season of 1905), it contained 180 parts per million. Hay from the same ranch cut in August, 1904, contained only thirty parts to the million, while by the next April the grass in the same field had increased its arsenic content to 263 parts. During 1906 the Para ranch gave twelve parts in July, thirty-four in September, and 121 in November. There is, of course, some objection to a comparison of the grass with the hay, since a certain portion of the arsenic of the latter is shaken off by the cutting and stacking. Even with the grass it is difficult to obtain

the original arsenic content, since the sample must be cut, put in containers, and transported to the laboratory."[11]

The observations of the writer confirm the statements of Swain and Harkins with reference to the air currents, and the direction in which the smoke is carried. He arrived in Anaconda on his second visit of inspection the last week in June, 1906, and for four weeks thereafter it was rarely and for very short periods that the smoke drifted northward over the Deer Lodge Valley. On July 28 he saw the smoke for the first time after his arrival spread out over the valley and envelop it for several hours; while from August to January the smoke was frequently on the valley, ulcers appeared in the nostrils of horses at pasture and other symptoms of poisoning were activated.

As it is the direction of the smoke stream and the time of exposure which are the principal factors in determining the quantity of arsenic found on the grass, so the maximum percentage of arsenic may be found in one part of the valley at one season of the year and in an entirely different part at another season. Further, as it is only when the grass or hay carries a heavy percentage of arsenic that symptoms of subacute or acute poisoning occur, it is easy to see how animals on the same farm may fail to show well-marked symptoms during the greater part of the year and yet be severely poisoned or succumb during the remaining period when the arsenic content of the grass is at its maximum.

COMPARISON OF THE QUANTITY OF ARSENIC DEPOSITED IN 1902 WITH THAT FOUND IN 1906.

Unfortunately, but few analyses of grass were made by Swain and Harkins in 1902, and these few constitute all the direct evidence in the writer's possession by which he can make a comparison as to the quantity of arsenic deposited upon the grass before and after the modification of the smelter. These analyses are as follows:

Table Showing Analyses by Swain and Harkins of Grass and Hay From the Vicinity of the Washoe Smelter, November, 1902.[12]

Number of Sample	Description of Sample.	Distance (Miles) and Direction From Smelter.	Arsenic Trioxide. Parts Per Million of Air Dry Sample.	Arsenic Trioxide. Grains Per 25 Pounds of Air Dry Ration.
1	Grass	0.25 E	1551	271.4
2	Grass	3.0 W	166	29.0
3	Grass	4.0 W	88	15.4
4	Hay	1.5 S	283	49.5
5	Hay	3.0 W	36	6.3

These analyses were all made in November, at or about the time when the acknowledged poisoning was at its maximum. The first gives an extraordinary quantity of arsenic, but the grass was taken within a quarter of a mile of the smelter and with the short stacks this probably accounts for the high percentage. The other samples taken from points 1.5 to four miles distant give a less proportion of arsenic than many analyzed in 1906. Indeed, if we exclude the one clearly unusual sample of 1902, the average of the remaining samples gives twenty-five grains of arsenic for each twenty-five-pound ration, while the average for all the analyses of 1906 is 25.2 grains, or almost exactly the same. If we include the extraordinary sample, the average for 1902 would be 74.3 grains of arsenic for each twenty-five-pound ration, while the average of the highest seven samples of 1906 is 74.1 grains. Without endeavoring to draw a more sweeping conclusion from the analyses of 1902 than is warranted by their number, it seems evident that the deposition of 1906 was greater in some places than that of 1902, and that the average was so near in the case of the higher samples as to furnish strong presumptive evidence of poisoning. Moreover, the mere fact of grass being so charged with arsenic in 1906 that each twenty-five-pound air-dry ration contained such quantities as 51.3, 62.8, 75.4, 80.5, 84.3 and 123.4 grains, is of itself, with-

out the confirmation of the previous poisoning of 1902, presumptive evidence of poisoning.

It may be said, therefore, by way of recapitulation, that a consideration of the data obtained by a study of the course of the smoke after it leaves the new stack; by a study of the effect of the flues, dust chambers and arsenic plant; by calculations made from the quantity of arsenic admitted to escape daily with the smoke, and by actual analyses of the grass and hay leads to the conclusion that there was no such difference between the conditions of 1902 and 1905-6 as to permit the admission of acute and general poisoning in the first mentioned year and, at the same time, the denial of any injury whatsoever during the two years last mentioned; and further that the quantity of arsenic found on the grass and hay is of itself indicative of poisoning.

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(2) Harkins, W. D., and Swain, R. E. The Determination of Arsenic and other Solid Constitutents of Smelter Smoke, etc. *Journal of the American Chemical Society*, XXIX., No. 4, April, 1907, page 995.

(3) Hunt, Judge William H., loc. cit., page 12.

(4) Harkins, W. D., and Swain, R. E., Loc. cit., page 995.

(5) Loc. cit., page 994.

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(7) Haywood, J. K. Injury to Vegetation and Animal Life by Smelter Wastes. United States Department of Agriculture, Bureau of Chemistry, Bulletin No. 113, page 27.

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(9) Swain, R. E., and Harkins, W. D. Arsenic in Vegetation Exposed to Smelter Smoke. *Journal of the American Chemical Society*, XXX., June, 1908, page 917.

(10) Haywood, J. K. Injury to Vegetation and Animal Life by Smelter Wastes. Loc. cit., page 28.

(11) Loc. cit., page 922.

(12) Loc. cit., page 917.

DR. LEONARD W. GOSS, professor at the Kansas State Agricultural College, Manhattan, Kansas, left the United States May 1st to attend the veterinary colleges of Germany for the next three semesters. We wish the doctor much pleasure in his visits to Dresden, Munich, Hanover and Berlin.

SERO DIAGNOSIS OF GLANDERS.*

By Dr. K. F. Meyer, Assistant Professor of Pathology and Bacteriology, School of Veterinary Medicine, University of Pennsylvania, and Director of the Laboratory of the Pennsylvania State Livestock Sanitary Board.

(*Continued from May issue.*)

In a publication on the sero diagnosis I expressed my great faith in the complement deviation test, but admitted that in tropical countries the agglutination test should always be made at the same time, because certain blood diseases, as well as other unknown factors, may slightly modify the complement deviation test.

The technique of the complement deviation test is briefly as follows:

It is advisable to undertake the test in two ways, especially when many sera have to be tested.

The first test is made in the following manner: In each of two test tubes is put 1.0 or 2.0 c.cm. saline solution, of a strength of 0.85 per cent.; then 0.2 or 0.1 c.cm. inactivated serum of the horse to be tested is added. In the first test tube 1.0 c.cm. antigen (1.100) is placed; the second tube which serves as a control for the serum is left free from antigen. The complement is added in a dilution of 0.03 (or 0.02 as was found in a previous test). The content of the tube is slightly shaken and incubated at 37 degrees for an hour. Then in each tube the inactivated hæmolytic serum of a rabbit is added in quantities which have been previously ascertained. The red blood corpuscles are put in last, the tube is shaken, then incubated for two hours, then

*From the Pathological Laboratory of the School of Veterinary Medicine, University of Pennsylvania.

kept in a room temperature for twelve hours, when the result is noted.

Animal.	Immune Serum.	Complement (geno. 03).	Antigen Extract, 1:100.	Hæmolytic Amboceptor, 1:1200.	Sheep Blood, 5%.	Result.
Horse						
3781	0.2	1.0	1.0	1.0	1.0	Hæmolysis.
	0.2	1.0	...	1.0	1.0	"
4447	0.2	1.0	1.0	1.0	1.0	Very slight.
	0.2	1.0	...	1.0	1.0	Hæmolysis.
Mule	0.1	1.0	1.0	1.0	1.0	"
4774	0.1	1.0	...	1.0	1.0	"
4776	0.1	1.0	1.0	1.0	1.0	Slight Hæmolysis.
	0.1	1.0	...	1.0	1.0	"
Horse	0.2	1.0	1.0	1.0	1.0	No Hæmolysis.
3253	0.2	1.0	...	1.0	1.0	Hæmolysis.
Mule	0.1	1.0	1.0	1.0	1.0	No Hæmolysis.
4138	0.1	1.0	1.0	1.0	1.0	Hæmolysis.
4809	0.1	1.0	1.0	1.0	1.0	No Hæmolysis.
	0.1	1.0	...	1.0	1.0	Hæmolysis.
4537	0.2	1.0	1.0	1.0	1.0	"
	0.2	1.0	...	1.0	1.0	"
Horse	0.2	1.0	1.0	1.0	1.0	"
4604	0.2	1.0	...	1.0	1.0	"
Mule	0.2	1.0	1.0	1.0	1.0	"
4625	0.2	1.0	...	1.0	1.0	"
Horse	0.2	1.0	1.0	1.0	1.0	"
4806	0.2	1.0	...	1.0	1.0	"

Naturally, for each test the necessary controls have to be made, namely:

I. The serum of the horse has to be tested in its double quantity, 0.4 c.cm., and is not allowed to deviate the complement. In this test we must have complete hæmolysis, otherwise the test will have to be repeated.

II. The serum must be tested as to its normal hæmolysis in the quantity used, that is, 0.2 c.cm. serum without hæmolytic amboceptor will give no hæmolysis.

III. Serum of the horse has to be free from complement, properly inactivated and has to give in this quantity of 0.2 no hæmolysis.

IV. The antigen in the quantity used is not allowed to fix the complement. There must be in the dilution 0.01 complete hæmolysis, when no serum is added.

V. The double quantity must not deviate the complement, and is, therefore, without serum in the quantity of 0.02 c.cm. used; hæmolysis is then present.

VI. The hæmolytic system alone has to be perfect in giving, without horse serum and antigen, a complete hæmolysis.

VII. The hæmolytic serum has to be properly inactivated and the system must give, without complement, no hæmolysis.

VIII. The complement serum must be free from hæmolysins and must give, with the blood corpuscles alone, no hæmolysis.

IX. The physiological water, or saline solution, has to be tonic, which means the red blood corpuscles in a solution of 4 c.cm. of the saline solution must give no hæmolysis at all, otherwise the entire test is unreliable.

CONTROLS.

Test Tube No.	Horse No.	Immune Serum.	Antigen.	Hæmolytic. Complement.	Hæmolytic. Amboceptor.	Blood, 5%.	Result.
1		....	1.0(0.001)	1.0	1.0	1.0	Hæmolysis.
2		....	2.0(0.002)	1.0	1.0	1.0	"
3	Gen.	0.02	.....	1.0	1.0	1.0	"
4	Serum	0.4	.....	1.0	1.0	1.0	"
5	of	0.2	.....	1.0	...	1.0	No hæmolysis.
6	Horse	0.2	.....	...	1.0	1.0	" "
7	4481	....	.....	1.0	1.0	1.0	Hæmolysis.
8		....	.....	1.0	...	1.0	No hæmolysis.
9		....	.....	...	1.0	1.0	" "
10		....	.....	...	...	1.0	" "

In the second step of the test each horse which gave with 0.2 serum hæmolysis or partial deviation is tested in descending doses, 0.1, 0.05, 0.02, 0.01 in the same way with the necessary controls, as shown in the able below:

TEST OF ONE HORSE.

	Immune Serum.	Complement (0.03).	Antigen, 1.100.	Hæmolytic Amboceptor.	Sheep's Blood, 5%.	Result After Two Hours.
1	0.01	1.0 (0.03)	1.0	1.0	1.0	Hæmolysis.
½	0.01	1.0	...	1.0	1.0	"
3	0.02	1.0	1.0	1.0	1.0	Slight hæmolysis.
4	0.02	1.0	...	1.0	1.0	Hæmolysis.
5	0.1	1.0	1.0	1.0	1.0	No hæmolysis.
6	0.1	1.0	...	1.0	1.0	Hæmolysis.
7	0.2	1.0	1.0	1.0	1.0	No hæmolysis.
8	0.2	1.0	...	1.0	1.0	Hæmolysis.
Control.						
9	0.4	1.0	...	1.0	1.0	Hæmolysis.
10	0.2	1.0	...	...	1.0	No hæmolysis.
11	0.2	...	...	1.0	1.0	" "

From explanations just given the following substances are necessary to carry out this test:

First—The serum of the animal to be examined.

Second—Glanders bacilli in the form of an emulsion or in the form of an extract.

Third—Complement obtained from a guinea pig.

Fourth—A hæmolytic immune serum from a rabbit, and

Fifth—An emulsion of red blood corpuscles of a sheep.

First—The immune serum. This serum is generally obtained in the way indicated, namely, withdraw the blood from the jugular vein and collect the serum from the coagulum. This serum contains the specific amboceptor and will retain it for a long time if kept preserved and protected from light at low temperature. After two months, especially when carbolic acid has been added, a slight diminution of the specific antibodies will be detected (Pfeiler). I had sera where the amboceptors were constantly present over eight and one-half months. The serum can only be used with success when heated before use to a temperature of 50 to 60 degrees C. to destroy the complement and to inactivate the serum. Schutz and Schubert, Miessner and Trapp, and the writer pointed out that this inactivation is absolutely necessary to obtain specific reactions, especially when mule serum has to be tested. We showed that serum which has not been inactivated, generally deviates the complement continuously and gives non-specific reactions. This spontaneous deviation is due to certain substances which are present in the serum, but which can be destroyed when the serum is heated to a temperature of 60 to 62 degrees. I, personally, favor very much, heating the serum to 62 degrees, because from my experience in examining over two hundred samples of serum of mules, I became convinced that this is the only suitable temperature by which to destroy the non-specific bodies.

From experiments carried out by Schutz and Schubert as well as by myself we know that the serum in a large quantity (over 1 cubic centimeter) gives a spontaneous deviation, which means that certain non-specific substances are present in small quantities which deviate the complement. It is therefore best to follow the method given by Schutz and Schubert, and use descending doses from 0.2 c.cm. to 0.01. If specific antibodies are present, complete deviation will take place with the serum of 0.2, 0.1 until 0.01 c.c. If, instead, as it happens occasionally in chronic glanders, the specific bacteriolytic amboceptor is present only in minute quantity, a specific deviation may take place only in a dilution of 0.2.

It was shown by Miessner and Trapp and corroborated by myself in unpublished experiments on mules, that the specific bacteriolytic amboceptors appear from the eighth to the tenth day after the infection and increase gradually to a maximum, so that about the eleventh or twelfth day a complete deviation is present in a dilution of 0.01 serum. After a certain time, which in horses varies widely, the specific amboceptor gradually disappears, which means that we obtain in a horse, which has been infected with glanders for perhaps eight or ten months, only a deviation with 0.2 or 0.1 c.c. of serum. To study these changes we have naturally to examine a large number of animals under differing conditions.

Pfeiler, Miessner and Trapp and I found that the mallein injection in healthy horses produces, after an incubation time of five to ten days, specific antibodies in the serum. If, therefore, a serum has to be tested by this method, we should collect the serum before the mallein has been injected; or, if mallein has been injected, we should wait at least a fortnight to three weeks before collecting serum for the sero diagnosis of glanders. We know from experiments of all the investigators mentioned, that these antibodies produced by inoculation of mallein disappear after a short time.

The serum of healthy horses gives, under normal conditions, a deviation only with higher quantities of serum, Miessner and

Trapp, Schutz and Schubert found a very small number of animals (about seven out of 3,000) which deviated in a dilution of 0.1 down to 0.01. These facts must be kept in mind, and it is stated by all investigators that an additional agglutination test must, therefore, be made, because only by this combination of agglutination and complement deviation can mistakes be avoided. I confirm the statement made by Miessner and Trapp, that no case is known where an animal has been declared to be free from glanders and proved later on to be affected with this disease.

The serum of sick animals which are not suffering from glanders deviates the complement in no way; for instance, strangles, epizootic lymphangitis, purulent cellulitis. On the other hand, in tropical countries the conditions, as I have explained them in my publications on this subject, have to be kept in mind. For example, in piroplasmosis in horses, under certain conditions a deviation may be found which has absolutely nothing to do whatever with glanders. The serum of cats and guinea pigs suffering from glanders gives also a specific reaction.

Second—Antigen. By the experiments of Schutz and Schubert, Miessner and Trapp *et al.*, it was shown that the most suitable antigens are obtained by using an extract of glanders bacilli. This extract is obtained by growing highly virulent glanders bacilli on glycerin-potato-agar. This bacillary growth is washed off after twenty-four hours with saline solution, the bacteria killed by 60 degrees C., the entire material thoroughly ground in a special mortar, shaken for from two to five days, then centrifuged and the clear fluid used. All the preparations with antiformin emulsions of the bacteria give very good results, but they have to be protected from light and kept at a low temperature. We generally use the extract in the quantity of 1 c.c. in a dilution of 1 to 100.

Keyser suggested that the extract of glandered organs in saline solution might give satisfactory results, but a few investigators could not confirm his opinion. It frequently happens that the glanders bacilli are not numerous enough in glandular ab-

scesses, and in nodules of the lungs or of lymphatic glands, to produce a sufficiently active antigen.

Several investigators have suggested that mallein be used instead of extracts of glanders bacilli, as antigen, but they all agree that the results obtained are so varying that it cannot be recommended for general laboratory technic.

Third—The complement. For the test, the complement found in the serum of guinea pigs is the most suitable, because the complement is present in more or less constant quantity and the serum can easily be obtained fresh. The animal is bled to death and the blood is centrifuged. Generally five or six cubic centimeters of serum suitable for the test may be obtained in this way. The question now is in what quantity to use the complement for glanders. It was Schutz and Schubert who pointed out that one should take the smallest quantity of complement which will, with the standard solution of hæmolytic serum, dissolve a five-per cent. solution of red blood corpuscles. Under such conditions it was found that no complement is left over to connect itself with the hæmolytic amboceptor and produce hæmolysis. All investigators considered this point, and I myself recommend that the complement be used only in the smallest efficient quantity. For laboratory routine it is advisable to test the serum early in the morning, and to keep the guinea pig serum in an ice chest for the entire day. Only fresh guinea pig serum should be used.

Fourth—The hæmolytic amboceptor. This is obtained by inoculating rabbits with increasing doses of clean sheep blood corpuscles. This inoculation must be intra-peritoneal, because only by this means do we obtain a serum of high standard. This serum can be preserved with a small amount of carbolic acid and will then remain active for six months.

Fifth—Sheep blood corpuscles. Sheep blood corpuscles are obtained by drawing blood from the jugular vein of the sheep. It is then defibrinated, diluted with saline solution and centrifuged. When the red blood corpuscles have settled to the bottom of the tube washed again with saline solution. This

process is repeated seven times, and afterwards a five-per cent. solution in physiological water is obtained for the test. The red blood corpuscles must be tested before applied for a general test. This can be done when testing the hæmolytic amboceptor and the complement with the fresh collected corpuscles every day before used in the test. Several investigators found that the blood corpuscles of each sheep may show quite different disposition to be dissolved, therefore a test is absolutely necessary. When all these ingredients are prepared and ready at hand the test is carried out in the way explained before.

I wish to state that the technic of the complement deviation test in the majority of cases which I explained, was carried out according to the method devised by Schutz and Schubert. I consider this very important for the correct judging of results in new serologic methods. If every investigator were to use his own way of testing the serum, he would never be able to compare his results with those of others; this part of scientific collaboration is important particularly with respect to any method which has still to find its true place in practical application. Many details can be altered and adapted to the special conditions of a country, but the principal outlines should be followed as given by Schutz and Schubert. I am able to deduce from my test of more than 600 animals, and from more than 3,000 serum tests, that in full accord with Schubert's results, the deviation of complement in connection with the agglutination test can be applied for the eradication of glanders in stables in the following way:

1. Any horse giving a complete deviation of the complement with its serum in the quantity of 0.2 or lower (0.01) should be destroyed, because it is surely affected with glanders.

2. Horses and mules recently infected with glanders give generally, during the first twelve to fourteen days, no or only an incomplete deviation with 0.2 or 0.1 serum, but have a high agglutination standard over 1/1000. A retest after eight to fourteen days shows whether the animal is really suffering from

acute glanders, or whether it has only a abnormal amount of normal agglutinatins.

3. The injection of mallein gives rise to bacteriolytic amboceptors in the serum, which fact has to be considered when testing animals from a stable where mallein has been applied. The binding properties of the complement in this case increases rapidly after four to eight days, but disappears gradually after four to six weeks. In diseased horses the decrease takes place very slowly and remains often very high for over a month. (In two of my cases over a year.) Therefore, a second test has to be applied after a fortnight to all horses in the stable; the decrease of the bacteriolytic amboceptor will indicate that mallein and not a real glanders affection has produced the deviation.

4. All horses giving incomplete deviation with 0.2, and a high or low agglutination titer have to be retested after three weeks. If now the deviation in the serum becomes negative and the agglutination remains at the same height, the animal should be discharged, because it is not suffering from glanders. If, instead, the complement deviation becomes positive and the agglutination standard increases, it is suffering from acute glanders. On the other hand, if the complement deviation test becomes negative and the agglutination standard becomes lower, it is suffering from chronic glanders, and it is advisable to dispose of the animal without waiting for another test.

The test has been introduced in the laboratory of the Pennsylvania State Livestock Sanitary Board. I express herewith the hope that this test in connection with the agglutination test will be employed in all the laboratories on this continent, and that results may be published at an early date, in order that we may be able to discuss further conclusions and to control this destructive disease, so inimical to agriculture and public health.

A VALUABLE paper, by Prof. L. A. Merillat, entitled "Surgery In General—Treatment of Wounds," presented at the Minnesota State Association meeting, will appear in the July issue of the REVIEW.

THE USE OF SLINGS IN VETERINARY PRACTICE.

By S. R. Howard, V.S., Hillsboro, Ohio.

Upon this subject, I can only speak from my own use as a country practitioner.

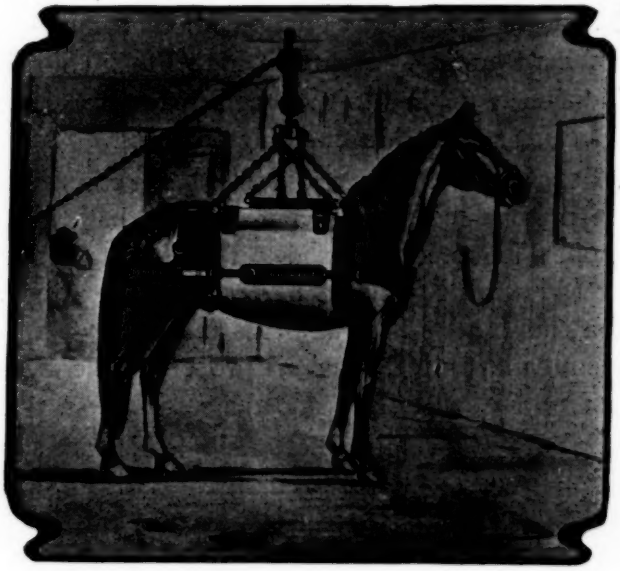
To my mind, a very important aid in many medical and surgical cases is the apparatus known as a "sling." A veterinarian may be thoroughly equipped with theories and ideals, but if he has not at the proper time a handy, strong, clean sling and knows how to use it, he will fail with his case and lose out in the estimation of his clients.

There are many patterns of sling, some of which are rather expensive and complicated machines.

I have always made my own slings and here is the way to water-proof duck before making it up: First lay it out on a large bench. Then take a block of paraffine about six inches square and rub it over both faces of the duck, bearing down hard. This will leave thin films of paraffine on the faces of the duck. Melt these films of paraffine into the goods, using a flat iron that is just warm; too hot an iron will set the paraffine on fire and burn the duck. It is well to experiment with a small sample first and learn how to do the water-proofing before starting. To determine when the sample is well water-proofed, hold it in a kind of bag, with the face in and pour in some water. If the water-proofing has been properly done, the water will not wet the duck, but it will stay in globules and act as if it were on a greased board or hot stove. The duck will then stay soft, last many years, be easily cleaned and remain pliable.

A sling is usually made of leather or coarse duck, folded several times, twenty-one to twenty-four inches wide and about six feet long; at the ends of which I securely fasten 1½-inch piping,

the ends worked into solid eyes for fastening shore pieces of 5-16 log chain. The shorter the chains, the better, because that economizes height in a low hitch. This broad belly-band may be re-enforced by broad straps stitched on the outside of the whole length of the edges. The buckles for breast and hip



Pattern of Slings used by Author.

straps should be solid, 1¾ inches wide or wider; the other buckles should be at least 1½ inches wide. A leather sling can long be preserved when not in use, by being occasionally dressed, kept covered, hanging unrolled, dry and away from dust.

Smallness of bulk and lightness combined with great strength, are the important requisites in the making of a sling. It is always good practice to inquire the approximate weight of your patient before visiting him if he is down. You then know what to take along. I use trees of two sizes—great strength, thin, exceedingly light and made from sheet steel double-trees manufactured by B. F. Avery & Sons, Louisville, Ky. I rasp the corners off close and swell the hooks. For a

horse weighing 1,500 pounds, or less, the smaller tree is used and weighs 7½ pounds, making that collection to weigh about 65 pounds. In addition to a good swiveled self-locking hoist (price with rope about $3.50), I also carry a single wooden pulley. Before raising the horse, I fasten this block low, string the end of rope through it and to it hitch a horse and when ready he is lead straight away, thus doing without a number of men and a lot of hard pulling. A little "high life" (bi-sulphide of carbon) judiciously applied to the small of the back, has a wonderfully refreshing effect in some languid cases.

In a widely scattered country practice, sometimes in isolated and almost inaccessible places where proper help is often not to be had, one's ingenuity is taxed to the utmost. It is no pink tea or butterfly work to raise a horse in a sling; and even the raising of a small horse may be made the labor of a Hercules; yet it is often comparatively easy, if properly done, even though the weather may be below zero and the snow a foot deep.

With a good self-locking pulley, a single block, a steady pulling "Dobbin" and a child or woman to lead him, as a young darky once said, "Dat ole Doc. Howard can raise any hoss in America all by his sef."

A discussion of this subject may properly be confined to equine practice, for it is seldom that the veterinarian is called to use his slings for animals of other species. The writer has found it necessarily expedient sometimes to put a cow or steer in a sling. Ordinarily, however, it is not satisfactory in cattle practice, and if applied, should only be for a few days at a time and with a view to lessen the animal's disposition to lie down, rather than to prevent it. When it is used continually, the pressure of the abdomen is likely to interfere with digestion and general health of cattle. The ox takes naturally to the recumbent posture. When down, the chest expands and, excepting in rare cases, there is no inclination to lie upon the side. The horse, on the other hand, does not take kindly to being down very long. If down any length of time and unable from any cause to rise, he

will become nervous and discouraged, lie upon his side, struggle, bruise his head, limbs and body and if not well nursed, will soon develop bed-sores. His grip will soon be gone, he has the hippo and he may lie in stony calmness until he dies, even though entirely able to stand when properly raised.

It might be well for us to consider our subject from a commercial standpoint, for undoubtedly in veterinary practice, the commercial element cannot be eliminated. Unlike man, a money value is placed upon the head of an animal and so the question will frequently rise: "Will it pay?" An old man, a city practitioner of long experience once contended with me that in city practice it did not pay the veterinarian to accept a case for a new client and raise a horse in slings. His argument was that in a city there is an immense clientage to draw upon, whereas in country practice every client must be conserved. This it seems to me, is a violence of professional pride. The practitioner, I believe, should be honest to himself and straightforward with his client. He should either decline or accept the case or immediately get down to business. Some veterinarians will not have a sling, but depend upon extemporizing one each time it is needed. I have been told that one way to shirk is to walk about the patient, not failing to appear the embodiment of wisdom, diagnose the case "spinal meningitis" or something else, leave some harmless medicine and depart. One disadvantage to such a course would be that the owner might call a live man following your visit, who, raising the animal, would find that he had simply become cast in the stall or been down owing to some minor disability. Please do not understand me as reflecting upon the members of my profession as to their energy. Taken in the aggregate, we are hard-working and painstaking men and with us it is not so much a case of work as it is of time. It is often a hardship for the busy practitioner to neglect other duties for that of slinging a horse. I have put in many a day and the greater part of many a night at such work.

Now a few words as to the more professional considerations. The slings are to be utilized for two general purposes, viz.:

First—To raise a horse from the recumbent position.

Second—To prevent him from assuming such position; but before discussing these phases of our subject, let us first consider some of the conditions and diseases in which the use of slings are contra-indicated. First, we may safely say that slings are useless where more than one limb is entirely disabled for weight carrying. That is if the injury or paralysis is such that the animal assumes a "dead weight" after being raised to a natural height. Cases in point would be azoturia, complete breakdown in two limbs, extreme heat prostration, complete paralysis from any cause, etc. And again. The use of a sling is sometimes contra-indicated in cases of disability where the animal can readily and without apparent injury lie down and rise at will. However, I have not the least doubt that many of us can recall a number of such cases and that if each case had been put in a sling right in the start, the result would not have been so embarrassingly disastrous as it was. Hence, it is a safe procedure at frequent times to use a sling, for we do not always know the extent of injury.

Now under the first heading, or the use of slings to raise a horse from the recumbent position; slings should be resorted to in those cases where the horse is found down, unable to rise and the practitioner is unable for this reason to make a diagnosis. The following case in point is one you will all recognize.

You are called out early in the morning. You find a horse not young and somewhat reduced from hard work, down in the stall. You are told that he was found in that condition when the stable was opened at 3, 4 or 5 o'clock, as the case may be. A casual examination leads you to banish the possibility of a diagnosis of azoturia. You have the horse pulled out on the floor, free from the walls of his narrow stall, roll him upon his sternum, properly arrange his limbs, and he may, with proper assistance, outside the use of a sling, very readily rise; but if

not, how is the diagnosis to be made? It is possible that this horse, sore and stiffened, perhaps of that diathesis prone to osseus deposits, simply stood up for several nights in a single stall, fearing to lie down and at last, tired out, did lie down and through disability and lack of courage gave up after several ineffectual attempts to rise. I say that this may be the case, yet who can positively say that it is the case before he has examined the animal when in natural position upon his feet? He will indeed be a keen man, who can, with the horse recumbent, eliminate all possibility of a fracture of a rib, vertebra or limb, the displacement in a joint or rupture of a muscle, tendon or ligament. So it might be said that slings are always indicated when their use is essential to a correct diagnosis of the case and if there is any question in the mind of the practitioner either as to diagnosis or prognosis, he will do well to raise the animal before expressing his opinion. I very seldom express a definite opinion when a horse is down.

Under the second heading we will consider the application of slings to retain the horse in a standing position.

First. Their use may be indicated in certain cases, where, while the animal can readily lie down and rise, the act would cause injury to certain parts that are injured or under treatment, as in the case of fractures. I am informed that some practitioners invariably place a horse in a sling immediately following the use of the cautery or spavin. I have had no experience using slings in cases of cerebro-spinal meningitis.

Second. Their use may be indicated in case of injury to one limb where the animal is disinclined to lie down and stands upon the sound limb to the extent of causing swelling and injury.

Third. In those cases where it seems certain that if the animal goes down, he will be unable to regain his feet. Among such cases may be those in which we have just raised a horse. It may be best to retain such a case in slings for a few hours and on the other hand, it may be good practice to discard the slings after raising the horse, allowing him a good box stall with plenty

of good bedding, avoiding, however, the use of long straw. All such cases will depend upon conditions and must be decided according to the judgment of the practitioner.

One disease common to the horse in which slings are frequently used, is that dear old tetanus. When a horse with this disease lies down and rises at will, he is almost certain to recover (provided he does not receive too much medicine and attention). Some make a practice of placing nearly every case of tetanus in slings. I will not discuss the advisability of such a course, but will make one plea for the use of sling in tetanus. Frequently a case progresses to the second and third week, the animal appears to be improving, when suddenly he is found down in the stall and in great distress. There is manifest dyspnoea, the legs are rigid, and to all appearances, the case is one of fatal spasm. This, however, is frequently not the case. The animal has gone down to rest, which is a favorable indication; but once down, fear takes hold of him and what he needs is to be quietly approached, reassured and assisted upon his sternum, from which position he may later rise to his feet, even without help of slings.

Charges for services and sling will depend upon the nature of the case, as well as various other circumstances. I never fail to state that I also charge for the length of time that the sling is kept. This usually brings it home promptly and that is important. Several times I have successfully used a sling in assisting blacksmiths in fitting shoes to the hind feet of heavy, awkward horses. As a rule, I have found it very unsatisfactory to myself, the owner, and a positive calamity to the down horse to loan the proprietor a sling, unless I also went to superintend the raising. No matter how much instruction is given, the job is seldom done properly. The horse is killed, a damaged sling is returned when I am out, I get little or no money, no credit and the owner is digusted. However, I have loaned slings to strangers, but they must first deposit with me the full value of the sling and my terms are fully made known at the time, so there will be no repudiation. Never fail to pointedly instruct

the user of your sling not to return it until he knows the patient has lain down and risen several times without assistance. The reasons are plain. In foals and unbroken horses, the sling, as a rule, must be dispensed with. However, in a few such cases, I have been successful in using a sling. In a green, unbroken horse, or a very fresh feeling one should be placed in a sling, he would either injure himself, or break through all restraint. However, by tying up his head for several nights, his spirit is destroyed. The sling may then be applied without fear of resistance. Do not adjust the sling tight, for that causes restlessness, but fit it snug; and in this fashion a horse may remain for months. With alternations of moderate exercise and rest in a sling, the effect of time and plenty of good feed will accomplish many cures. If the ground is covered with ice, you ask, "How can exercise be given?" Make a large circular path of sawdust, chaff, sand or such like and exercise on that as conditions are indicated. I have attended several mares that foaled live foals while in a sling, sucked their colts and afterwards did well. I once had a draft mare in a sling for five months. She would stand about five days in sling, then be turned loose in a large, comfortable shed where she would walk about sometimes for several days before lying down. After a good rest, there would be another raising and a five days stand to be repeated. She came out fat, sleek and sound, displaying none of the wear and tear so feelingly described by some authors. I have never seen a case of laminitis caused by a sling's use, yet I do not deny that grave evils have been wrought by the improper use of a sling. Bear in mind that continued, complete suspension is an absurdity. When your patient is down and in hoisting or rolling him on to a stoneboat, wagon or sled (I know nothing about city practice or the use of an ambulance) to be taken to a more convenient place, the head should be haltered and fastened down and by all means the feet should be hobbled and kept hobbled until you are ready for the final raising. No matter how much work it takes, invariably make the overhead hitch higher than is just necessary and make it doubly strong. This will pay. Wire is

plentiful, very strong and easily used. I have never had a case to fall for want of a proper support. I live seventy-five miles from a celebrated veterinarian, yet I have often heard him roundly cursed because a patient of his, a very valuable horse, fell with sling for lack of proper support, thereby injuring himself to the extent that he had to be killed. A never-ending reproach! Hence, I repeat, make your hitch doubly strong. The treatment of many cases where a sling is used, as for instance, fracture of the hip bones, the best measure, as I see it, is to place him in a stall of just sufficient width to admit him, either end first and apply the sling snugly, but comfortably. Then about the next best thing is a due practice of much patience. Patience is a powerful and miraculous salve.

Salve of Patience.

Understanding ..... 1 quart.
Resolution ..... 1 pound.
Common Sense..... 11 grains.
Practical Experience..... 5 pounds.
Large Sprig of Time.....
Expectation....."A right smart."

Mix and add 3 quarts of the cooling water of consideration. These things may be had of the apothecary next door to reason, in whose house a successful veterinarian has his office.

Personally, I have had no experience with slings on board ship. Capt. Fred Smith says: "Slings are quite unnecessary; in bad weather they are a positive evil, for a horse, if lying in one, simply swings about and is bruised all over. In fine weather, particularly with delicate horses, they may afford a means of rest which the animal will not take any other way. Slings, moreover, heat the body, become dirty and hard and the animal trusting to them, takes the weight off his feet and so disturbs the circulation in these parts, which we know is so much assisted by the body movements; thus we have a predisposing cause of laminitis. Dr. Duck says that a strong argu-

ment in their favor is that they prevent horses falling in their stalls and getting under the rear bar, a position from which they are extricated with great difficulty; but he believes and has, moreover, practical experience to bear him out, that cinders or coirmatting put down, will prevent this falling about and when it does occur, as it will do in bad weather, it is probably generally due to prostration from sea-sickness. A proportion of slings should be found on board for use in suitable cases."

DR. W. C. HOLDEN, of Delphos, Ohio, writes: "Please find enclosed a check for $3, for another year's subscription to the AMERICAN VETERINARY REVIEW; as I have been a reader for more than 20 years and never missed a single copy."

THE program of the semi-annual meeting of the Colorado Veterinary Medical Association, Fort Collins, June 2 and 3, is certainly suggestive of a splendid meeting; filled with valuable subjects for discussion and elucidation by its members and attendants.

ARMY REMOUNT STALLIONS. Henry of Navarre and Octagon, the thoroughbred stallions presented by Mr. August Belmont to the United States Government for the purpose of breeding horses for use in the army, arrived last week, on board the steamship "Minneapolis" from France. They were officially received by Capt. C. H. Conrad, U.S.A., sent here by Major General Wood, especially to take charge of them.

Henry of Navarre and Octagon were shipped over the Pennsylvania Railroad to Front Royal, Va., the cavalry remount station of the army. They will be bred to mares owned by farmers in the neighborhood.

Captain Conrad said he had great hopes of the successful forming of a breeding bureau, which would be of great service in giving better mounts to the army. After examining Henry of Navarre and Octagon he said they were in fine condition.—*Rider and Driver*, April 8, 1911.

CAUSES FOR TUBERCLE BACILLI IN MARKET MILK AND METHODS FOR THE CONTROL OF BOVINE TUBERCULOSIS.*

By V. A. Moore, Ithaca, N. Y.

It is with considerable hesitancy that I attempt, in a few minutes, to discuss this many-sided subject involving, as it does, the health and financial well-being of both country and city people. Of the diseases which affect man and beast, there is no other in which so many people are so intensely interested as they are in tuberculosis. The reason for this is not hard to find. Because of its insidious nature and its slow development it has evaded the watchfulness of man and found its way into almost every circle and taken from us those who seemed to be the brightest and who promised to be the best. More than this, it has grown into the herds upon a thousand hills. As a destroyer of man, tuberculosis has no equal; as a scourge of cattle there is no other with which to compare it.

In order to appreciate the significance of bovine tuberculosis fully, it must be understood in connection with all of its relations and conditions. In recent days, our people have awakened to its destructiveness, the suffering it occasions, and the hardships it has brought to humanity. It would seem, from the great activity of the present concerning it, that tuberculosis was a new disease of cattle. This is not the case, but quite the contrary, it is one of the oldest affections of the bovine species of which we have identified records. Long centuries before the Christian era, there were ecclesiastical enactments against the consumption of the flesh of tuberculous cattle. All down the centuries the enactments of the people of one generation concerning it have been modified or rescinded by those of the succeeding ones.

* Presented before the New York Farmers, Feb. 21st, 1911.

The real problem with tuberculosis began to unfold itself with the discovery of the tubercle bacillus in 1882. This proved that tuberculosis was a specific infectious disease. It was believed by Koch, and those following his methods, that the bacilli of tuberculosis of man and other mammals were identical. The next important discovery was tuberculin. Koch found, in 1890, that the fluid on which tubercle bacilli had grown possessed certain properties, among which was that of causing a rise of temperature in animals suffering from active tuberculosis. In testing this it was found that large numbers of apparently healthy cattle were infected. This gave rise to the great movement in this country of testing dairy cattle with tuberculin and killing the reactors. To do this the states were called upon to make large appropriations to partially compensate the owners for the animals destroyed. The sanitarians and others who advocated this procedure were working on three hypotheses: (1) That the human species was being extensively infected with the bovine germ; (2) that tuberculin was an infallible diagnostic agent, and (3) that all infected cattle were spreading the bacilli.

In 1898, Dr. Theobald Smith reported his very significant findings that there were three distinguishable differences between the human and bovine tubercle bacilli. These were differences in the appearance of their growth on blood serum, their morphology and their virulence. He pointed out that the bovine germ was virulent not only for guinea pigs, but also for rabbits, cattle and other species, while the human species possessed little, if any, disease producing power for these animals other than the guinea pig. This was followed in 1901 by Koch's famous paper at the International Congress on Tuberculosis in London, at which he gave the impression that human and bovine tubercle bacilli were entirely different. This caused considerable consternation in the ranks of the sanitarians. It stimulated a large number of investigations, many of which have been continued until the present time. The German and English governments appointed commissions to investigate the subject. The result is that two very well-defined varieties of mammalian tubercle

bacilli have been determined, one in man, the other in cattle. The further fact has been made very clear, that young children are frequently infected with the bovine type of the germ.

The many examinations for tubercle bacilli in the market milk of our large cities have shown that from five to sixteen per cent. of the samples contain tubercle bacilli. This is a fearful indictment against our milk supply. It discloses a menace to public health resulting, according to statistics, in the death of from 100 to 200 children annually in this city alone. Economically it threatens the milk industry by creating a legitimate fear of this most natural of all foods.

The questions I was assigned to answer are, Why are there so many tubercle bacilli in the market milk of our large cities, and what methods are there for the control of tuberculosis in cattle?

The explanation for the bacilli in the milk is found in two facts: First, the ordinary inspection of dairies by Boards of Health is made largely by laymen, who are not qualified to judge of the physical condition of the cows which are producing the milk. The second is that the severity of the American method of testing with tuberculin and killing the reacting animals has discouraged dairymen from making the test privately, and the state appropriations have been too small to have them made officially. The result is that an efficient, systematic method to prevent the entrance and to check the spread of tuberculosis in cattle is being followed in a very small percentage of our dairies. Again, other factors have contributed to the present conditions. Among these was the former habit of selling at auction badly infected herds, often pure-breds, where owners of sound animals bought one or two individuals to improve their stock, but in so doing they unfortunately, and perhaps innocently, bought centres of infection. Another cause is to be found in the constantly increasing demand of the growing cities for more milk, and the demand is continuous throughout the year. This has revolutionized the former methods of handling milch cows. To supply the demand dairymen must keep their herds milking throughout the

year, hence they buy fresh cows and sell the dry ones. By reason of this a mighty stream of living cattle is constantly flowing through our dairy districts. Many of these animals are infected, but they continue in the stream until they become well advanced cases and spreaders of the virus before they are sold as "band boxes" to certain dealers who dispose of them for certain forms of cheap meat. It is the presence in the dairies of advanced cases of pulmonary and intestinal tuberculosis and cows with tuberculous udders that causes a large number of tubercle bacilli to be found in our market milk.

The control of bovine tuberculosis has been a subject of much thought. Many of the channels nature provided for the dissemination of tubercle bacteria have not been closed with the promptness that might be expected. The control of a disease like tuberculosis in which the infected animals still retain their productiveness for a very long time, presents difficulties of both sanitary and financial significance that are hard to adjust.

The American system of tuberculin testing dairy cattle and slaughtering the reactors has been, and still is being, carried out as extensively as the state appropriations permit. It was found, however, that there were too many animals infected to apply the method generally, as sufficient funds were not forthcoming. As a result, the official use of tuberculin is greatly restricted. In 1910, only about one per cent. of the cattle of this state were officially tested. The milk consumers and often the health authorities in this country have demanded the tuberculin testing of cattle and the slaughter of the reactors—no matter how slightly they were affected—or they have been content to do nothing. Our people have not been willing to abide by conservative, progressive methods that would steadily increase the purity of the milk and eventually eliminate the disease. Bovine tuberculosis has, under the changed conditions in milk production, had an opportunity to spread rapidly owing to the great increase in cattle traffic.

In the American plan of control two theories have been accepted as working hypotheses, namely, that a single tuberculin

test is sufficient to detect all infected animals, and, secondly, that all animals that react are immediately dangerous, that is, they are active in spreading the disease.

A long and careful study of tuberculin has shown that with a reaction there is present an active tubercular infection, but failure to react does not prove the absence of infection, for the disease may exist in the so-called period of incubation or its progress may have been arrested. In either instance it may develop later and perhaps rapidly destroy the animal. The criticisms against tuberculin are often based on a lack of knowledge of when it can cause a reaction and when it can not. Because of a neglect of these important facts herds have been tested once, the reactors destroyed, but no subsequent tests made to detect the possible recently infected or latent cases. These have developed later, the disease spread, and the last stage of the herd has become more serious than the first. For this tuberculin has been unjustly blamed, for, when properly used, it is the most effective diagnostic agent known to the medical profession. To use tuberculin effectively it must be repeated again and again. In buying cows it is the sound herd from which to purchase rather than the non-reacting individual from the diseased dairies.

The other supposition that all reacting animals are immediately dangerous has also been a topic of much investigation. For several years I have been working on this subject. We have made single examinations of the milk and feces of a large number of reacting cattle and again we have made repeated examinations of the milk and excreta from a few cows extending over a period of eighteen months at least. Our results thus far have been that the milk of cows with udder tuberculosis contains tubercle bacilli usually in enormous numbers. It is stated that from one to three per cent. of tuberculous cows have the disease localized in the udder. In advanced pulmonary tuberculosis the bacilli appear in the feces and may occur in the milk through fecal contamination. In reacting cows in which no evidence of tuberculosis can be found on a physical examination, tubercle bacilli have not been discovered in either the milk or the excreta.

There are reports of investigations along this line that largely confirm these findings. If these results represent the facts generally, it will be possible to greatly reduce the number of tubercle bacilli in market milk by having the cows furnishing it given careful physical examinations at short intervals and all suspicious animals removed.

In Europe there are in operation at least three methods for the control of tuberculosis. The Bang method, named after its distinguished author, Professor B. Bang, of Copenhagen, consists in eliminating all of the clinical cases, in testing the remaining cows with tuberculin, separating the reactors from the well and keeping them for breeding purposes. By this method the farmer is enabled to eventually build up a sound herd from the infected stock. In Denmark, however, the farmer is allowed to sell the milk from the reacting, but clinically sound cows. This method has been applied in fully ten per cent. of the dairies of Denmark. It requires rigid separation and frequent testing of the non-reactors in order to detect latent cases. Its great advantages are that it recognizes the rights of the cattle owners, educates them in the nature of the disease, enables them to build up sound herds, and further it affords protection to the consumer in that it eliminates the bacilli spreaders.

The Ostertag method, generally recognized in Germany, consists in a thorough physical examination of the cows and the removal of all suspicious cases. Tuberculin may or may not be applied. If it is used the reactors are not separated from the others. The calves are raised tuberculous free by feeding them milk from nurse cows. The animals are thoroughly examined at short intervals. The theoretical basis for this method is that the disease can be detected by a thorough physical examination before it has advanced sufficiently for the infecting bacteria to escape. Professor Ostertag states that the method, if rigidly carried out, will protect the milk from infection and eventually eradicate the disease from the herd. While it affords little or no protection for the inter-herd control, it seems to be effective for intra-herd

eradication. At our Veterinary Experiment Station we are now testing this method on a small number of experimental cattle.

The third European procedure is known as the Manchester method. It is used perhaps more than any other in Great Britain. It consists in making regular examinations of the market milk for tubercle bacilli. If they are found the herds from which the milk came are carefully examined and the cow or cows eliminating the bacilli are found and excluded. This method seems to deal with the immediately dangerous animals only. However, Delapine, of Manchester, and Boyce, of Liverpool, report a far better condition relative to tubercle bacteria in the market milk of their cities than the health authorities of our large cities have recorded.

After carefully studying these various methods, discussing them pro and con with their authors and examining the herds in which they are being applied, one cannot help but feel that in the eagerness to obtain absolute safety at once and to eliminate a great scourge from our cattle, the radical position taken by our people has tended to make real progress slowly. Dairymen have objected to the slaughter of their best cows which appeared to be well, while they would not object to the removal of all clinical cases of suspicious animals. The experience with the Ostertag method in Germany cannot be set aside without some reflection. The Bang method would, perhaps, be open to less objection in this country if dairymen could sell the milk from cows that have reacted to tuberculin, but which exhibit no physical evidence of the disease. At present our dairymen object to the Bang method because the milk cannot be advantageously used.

To summarize these somewhat brief and fragmentary statements, there seems to be justification for the following conclusions, namely:

1. The frequency of tubercle bacilli in our market milk is due to the fact that there is no efficient method for the control of tuberculosis in operation in a large majority of herds furnishing milk to the cities.

2. The American method of control acceptable to our sanitarians and milk consumers is so severe in its operations upon the dairymen that as a rule they are not willing to apply it. The established methods in Denmark and Germany, which could be applied and which would give constantly increasing safety to milk consumers, are objected to because the cows under such control might respond to the tuberculin test.

The remedy seems to be in a more rational view of the situation and in utilizing the valuable features in each of the methods. Dairy herds producing milk should be carefully and frequently examined by competent veterinarians and the suspicious cases promptly removed. Sound herds should be grown up to take the place of the infected ones. Tuberculin should be used, when possible, and the reactors eliminated in as economical a manner as possible. The crux of the whole situation, so far as the protection of the milk consumers and the spread of the disease are concerned, rests in the detection and removal of the cows that are about to become spreaders of the specific organisms. For this we are absolutely dependent upon an accurate knowledge of the natural channels through which the specific bacteria are eliminated from the diseased animal, and our ability and power to close the channels through which they gain entrance to the healthy individuals.

Tuberculosis is a parasitism that has come to be a great destroyer of man and of cattle, but like other injurious agencies it will disappear when people learn to avoid it.

PROF. J. J. FERGUSON, secretary of the United States Live Stock Sanitary Association, writes under date of May 20th: "As indicating the great interest taken by Management of Railroads in Live Stock territory in Sanitary Live Stock Transportation, I am pleased to report that the Santa Fe Railway has ordered and paid for 200 copies of the Fourteenth Annual Report of this association for general distribution to interested parties over their system."

MECHANICAL LAMENESS.*

By W. J. McKinney, V.S., Brooklyn, N. Y.

The title, "Mechanical Lameness" requires very little explanation to an assembly of veterinarians. I purpose, however, to attempt a definition, because once or twice lately I have heard magistrates dispute its existence. A certain magistrate of Brooklyn distinctly told a veterinary surgeon one day: "If a horse is lame he is suffering pain; the very fact of his being lame shows he is suffering pain." Another magistrate recently expressed the opinion that contracted tendons must be painful, and he said that if the whole Royal College of Veterinary Surgeons attended before him and said they were not he would not believe them.

In the human body we know that lameness may exist without pain; a man may have a stiff knee or ankle and he is lame simply because he cannot move his joints, and I do not think there is much imagination required to assume that the same thing happens with the horse, and that if there is mechanical interference with the movement of a joint—an essential joint in locomotion—there must be lameness. This is no new thing. I find in Percival, who wrote in 1849, a distinct recognition of mechanical lameness, although he does not use that word. He says: "It is pain that commonly produces lameness; inability in one form or another in the absence of pain will, however, be found as a proximate cause of lameness. The dislocation of the patella occasions no pain, and yet the horse is too lame even to move; the partial or complete ankylosis of a joint may cease to be attended with pain, and yet there may be permanent or irremov-

* Presented at the April meeting of the Veterinary Medical Association of New York City.

able lameness." Those illustrations are almost enough to show even an unprofessional man what is meant by "mechanical lameness." Of course it is extremely difficult if you enter into a metaphysical argument to prove that a horse does or does not suffer pain; you can only argue by analogy, but I think, considering that the structure of the nervous system of the horse is so identical with that of man, we have a perfect right to conclude that what holds in the human subject holds in the animal. Although it is very easy in a book or on paper to divide lameness into painful and non-painful or mechanical and non-mechanical, practically each case presents difficulties, because the mechanical lameness that exists may be the effect of a previous painful lameness which has passed off. Take, for instance, any long-continued painful condition of the foot. The result is that the horse from pain rests that foot, and in resting it he flexes the joints, and if you keep joints flexed for any length of time the tendons and white fibrous tissues contract and suit themselves to the fresh angles of the bones. If, for instance, you have a horse suffering from slight corns for many months, from navicular disease long continued, or from fever in the feet long continued, the certain effect of it is that he will go forward in the knees, and you may try all you can to extend those knees, either under chloroform or after death, and you will find it impossible. Why? If the knees were simply bent from pain in the feet you would be able, when the pain passed away, by physical force, to straighten the knee; but you find you cannot do so, either after death or during insensibility when under chloroform, because the white fibrous structures, the tendons have shortened themselves to suit this new angle of the bone. The tendons must be a perfectly definite length in relation to the angles of the bones upon which they act. It is the same with the string of a bow; if you wish to have a bow act perfectly, your string must be taut—it is no use trying to use a bow if the string is slack. If a bow were bent more than usual and retained that extra bend, the string which previously fitted exactly would be slack, and you have a mechanical condition rendering the action of the

bow imperfect. It is precisely the same with the bones, ligaments and tendons of animals. Immediately you alter the proper normal angle, the tendons passively contract so that they may meet the new condition of things and be taut, because unless the tendon is taut the muscle cannot act with proper effect. Not only, then, may a painful lameness cause a mechanical alteration in the bones, but the painful lameness may pass away and leave a mechanical deformity, and that mechanical deformity may cause lameness. If, for instance, both knees of a horse be shot forward, and the angles of the bones altered in that way, he will hardly go lame. When both legs are affected he will go "groggy" and shuffling, but not what the majority of people would call lame; but if one leg is affected and not the other he inevitably goes lame; there must be a halt in the action because the two legs practically are of different length from the body to the ground. A greater practical difficulty arises in these cases when you have a mechanical lameness and a painful lameness at the same time. We will take as an illustration of that the ordinary ringbone. When a ringbone has advanced so far as to unite the two bones together—the small and large pastern—as soon as that joint becomes ankylosed you have a mechanical impediment to motion. It does not follow that ringbones are painless; on the contrary nearly all ringbones are painful up to a certain stage, and it is only when the inflammatory process settles down and leaves the painless ring of bone that you have a purely mechanical lameness. But this is not an easy point to determine in practice; it is very difficult to say always whether the lameness of a ringbone is simply due to the mechanical ankylosis of the point or to ankylosis accompanied by pain. Again, you have this complex lameness in some cases of navicular disease. A horse suffering from navicular disease for any length of time gets his knees forward and the pasterns straightened, it may be to such an extent that the pasterns are what is called shot. When you have a bent knee and a shot pastern in connection with navicular disease, you have a painful lameness accompanied by a mechanical lameness. Another

condition not uncommon is where you have had sprains of the metatarsal ligaments at the back of the leg, just below the seat of the curb. Of course while that sprain is recent there is pain, and lameness due to pain; but I find that those cases hardly ever resume their normal condition, the leg seldom gets right entirely. The usual thing is that when the horse goes sound and the acute symptoms subside you have some shortening of the tendons at the back of the leg, the result being that the heel is raised from the ground and the horse goes on the toe. I have also noticed that when a horse once goes on the toe there is a tendency for the deformity to increase, and accordingly, as that horse remains at work the heel becomes raised more and more from the ground until the horse is utterly unable to get the heel down, even when you raise the other foot. The very fact of a horse going entirely upon the toe of one foot and on the heel and toe combined of the other renders him lame, and I hold that unless some distinct symptoms of pain can be recognized, this condition is simply and solely mechanical lameness. Again, in case of chronic lymphangitis, or any other condition which causes a very great amount of swelling of the leg implicating one or more joints, and thus interfering with flexion or extension of the joint, you have a mechanical lameness. Of course in the early chronic stages of lymphangitis there is great pain, but in the chronic state I think that the lameness which is left is merely the result of mechanical interference due to organized lymph—to use an old pathological expression—filling the subcutaneous tissues and causing adhesion of the skin to other parts. Spavin is another condition of that I should like to refer to. A horse suffers from spavin, by which I mean disease of the bones of the hock—we will put it widely—and in the early stages where you have exostosis upon the bones or in all stages where there is articular ulceration you have pain. Even in simple cases of exostosis such as splints, pressure upon the periosteum during growth causes a great amount of pain, and during the growth of spavin you may have distinct pain from a similar cause and a painful lameness. If spavin lameness continues for

any length of time—I mean by that some months—you nearly always have contraction of the tendons at the back of the leg, with the result that the heel is raised from the ground and the toe takes all the pressure Even in a mild case, before any noticeable contraction of tendons, you will find the wear of the shoe at the toe indicating an extra amount of pressure, due to the fact that the tendons behind are commencing to contract and that the horse does not rest the heel firmly on the ground. Now, in a case where you have a spavined hock, a shot fetlock, and the heel raised from the ground it is not easy to say whether that horse is suffering from a mechanical lameness or a painful one. If I hold it is a painful one no better sign can be had than a variation of the degree of lameness. If you have a mechanical lameness there can be very little variation in the amount of it, the horse comes out of the stable in the morning lame, he does his work lame and he gets home to the stable lame. Next morning, after a night's rest, he goes out of the stable lame, and the lameness on each occasion should be about the same if it is merely mechanical. If you have in connection with work, or as the result of work, a decided alteration in the amount and degree of lameness, then that lameness must be due to some other cause than a mechanical one, and the only other cause I can suggest is pain. Percival refers to this subject, and I take Percival simply because he is about our oldest writer. He says. "It is, we would repeat, truly astonishing what good effect work or forced use of the diseased joints have upon them, in proof of which we might instance the ringbones and spavined horses every day's observation brings to our notice, working in the streets of London, and it is incredible what labor such stiff-jointed, or partially stiff-jointed, horses are able to perform so long as the cavities of their joints remained uninvaded by disease." What I have said about ringbone and spavin applies equally to diseases of other joints. You may have stiff knees, stiff fetlocks as well as stiff hocks and coronets, and if the disease causes lameness which does not vary much, then I say you have a right to conclude that it is mechanical.

But if the lameness varies very much in relation to the working and resting of the horse then we can say that the disease is painful.

There is a practical importance attached to the settlement of this question. Every year veterinary surgeons are more and more employed in courts of law to give evidence, and these cases very often result in a considerable amount of conflicting testimony. I hold, in contradiction to what I often see stated, that there is no disgrace whatever to the veterinary profession because of this conflicting evidence. Every man has a perfect right to his honest opinion, and each man may differ from others as to the cause of lameness, as to the degree of lameness and as to the amount of pain, providing there is any present.

With regard to the contracted tendons, I do not believe they ever occur, except as the result of some other condition. Contracted tendons are simply passive conditions; there is no pain, but they may either accompany or be the result of a painful lameness, and the difficulty is to determine when the painful lameness has ceased, and left nothing but the mechanical. You see, therefore, although it is very easy on paper to divide lameness into two classes, painful and non-painful, when you get into practice, there is a very wide latitude, and a very great difficulty in determining exactly what the condition is. Such difficulties I believe allow, in fact necessitate, differences of opinion by veterinary surgeons when examining the case.

Instead of believing, then, that the differences of opinion expressed by four or five veterinary surgeons on one side, and four or five on the other are disgraceful to us, I believe, on the contrary, that they are honorable to us, and that they are absolutely unavoidable. So long as a man thinks for himself, so long as a man knows what may be and what may not be, he is bound to give the best opinion he can, and in a case where it is solely a matter of opinion, and where the symptoms are very vague and do not give one a clear opportunity of distinguishing between pain and mechanical conditions, I hold it is the duty of every member of the profession to give his opinion honestly

and boldly, perfectly irrespective of whether he is opposed by one or twenty men. The divergence of opinion is not a question of morality, it may be one of intelligence, and it is only egotism which enables one man to think all his brethren must be wrong.

This paper is read for a purpose, and that is, to call attention to the conflicting evidence, very often given before magistrates, when gentlemen of our profession are employed by the Society for the Prevention of Cruelty to Animals.

I will agree, we have honorable and conscientious men give their evidence in support of their opinions; but I believe there are men in our profession, and I say it without fear of contradiction, who will give evidence in courts of law in support of cases brought by the Society of Prevention of Cruelty to Animals, simply because they are paid to do so.

They go to the court on purpose to win the case, and obtain a conviction. I have felt, on many occasions, disgusted with the society, at the vindictive manner in which they have acted.

They will raise heaven and earth to gain a conviction, not with the sole object of preventing cruelty, but to get sentimental old ladies to support them. I do not believe there is a member of our profession, who would knowingly support a deliberate case of cruelty. I now leave the discussion in your hands, gentlemen, and I have no doubt, you will help elucidate the difficulties and enable some of us, perhaps, to take a clearer view of these questions in future.

PRESIDENT ACKERMAN requests, through the medium of the REVIEW, the members of the New York State Veterinary Medical Society, to send the titles of the papers they will present at the coming meeting, to Secretary Milks, 113 College avenue, Ithaca, N. Y., with as little delay as possible, so that the program of the meeting, which will be held in Brooklyn, September 12, 13 and 14, may be published in the July issue of the REVIEW.

ADDRESS OF DR. W. HORACE HOSKINS

At the Closing Exercises of the Ontario Veterinary College in Convocation Hall, Toronto, April 25, 1911.

Mr. President, ladies and gentlemen and graduates of the Class of 1911:

I deem it a great privilege on this occasion to have been called from the states to speak to this body representative of the interest that Canada has shown in the field of veterinary medicine. I come not as a stranger to your country, but one familiar with the history of your veterinary institutions for the past fifty years and I am somewhat intimately acquainted with those who have directed this institution for the past thirty years. I would be indeed forgetful if I failed to acknowledge here the great services rendered by the late principal of this institution, Prof. Andrew Smith, a pioneer in veterinary education and the practice of veterinary medicine and surgery in your own country, with which his life work was indissolubly bound, and with the development of your country in the broad field of agriculture and the domain of animal industry. He was a loyal man to his country; a devoted teacher and instructor deeply interested in his student body, ever rendering to them the highest scope of instruction within his power. Filled with true civic pride and deeply interested in the welfare of the people of his country, he rendered great services, indeed, in helping to solve many of the economic problems of his land and contributed in many ways to the development and prosperity of her people.

In the choice of Prof. E. A. A. Grange as Principal, I equally rejoice with you that as the successor of Prof. Smith, so distinguished an alumnus of the school and so worthy a member of the profession, imbued as he is with the highest ideals and

purposes for our calling, which assures the maintenance of the highest standard of education and the deepest and broadest interest for the protection of the live stock interests of all the Canadas.

I rejoice that I come at this time, the most auspicious within the history of veterinary education in Canada. It has long been recognized by those deeply concerned in veterinary education that it could not reach its full development unless supported by state or the national government.

The scope of veterinary medicine is so far-reaching and important from an economical point of view, that unless supported by national or state government it must ever remain limited in its sphere of progress and true development. I congratulate the Province of Ontario and the other loyal provinces of Canada in granting to this institution government support that its long history of work well done, justly entitles it thereto, the rich return it has given in the past to the people of your country makes it indeed justly merited. No field of learning has contributed so much to the wiping out of the imaginary or other boundary lines, whether they be of the narrow space determined by latitude and longitude or the vast waters of the oceans and seas, than the field of comparative medicine as one of the sciences. The freest exchange between all nations of the earth has ever existed in the development of scientific medicine and no nation has withheld from sister nations her discoveries, advancement or progress in the relief of suffering or in the saving of nations from great economic losses by the ravages of contagious and infectious diseases. Quick to respond, eager to extend, ever desirous to be helpful, comparative medicine has made the whole world akin, and in this way has contributed indeed untold aid and helpfulness in the preservation of peace and good will throughout the earth. I am not unmindful, and take this opportunity with the keenest personal pleasure in paying tribute to the splendid work done under the government of Canada in solving for her people, as well as the people of the earth, many of the obscure problems that sometimes cause enormous pecuniary losses to your people

as well as being destructive to the happiness and comfort of those engaged in the field of animal industry from frequently having swept away their monetary resources; the result of years of labor, sacrifices and self-denial. The generous support given by your government to the system inaugurated by your chief veterinary director general, Dr. J. G. Rutherford, a distinguished graduate of this school and a worthy public servant, has been the means of opening up thousands of acres of your untilled land and furnishing to a vast number of your own people and many of my own country, a field of employment and industry that has added millions to the wealth of your great country and aided the proper development of your nation. More far-reaching indeed than one can conjecture is the added strength and power of your people in solving for the older nations and for nations yet to come the problem of wise and just government that equal rights to all men and special privileges to none shall make for the well being, happiness and comfort of the people of every nation and clime.

No field of industry of all scientific research has been a greater factor in contributing to the betterment of the world and the common brotherhood of man than the free exchange of knowledge and the progress of solving these great problems as well as those that conserve the strength and health of all the people of the earth. And I rejoice that I am privileged to come at this time in the history of our sister countries when a feeling pervades the great majority of the people of your country and my own, that no false boundary lines should separate us in the common enjoyment of all things that would contribute to our comfort, our health and to our common commercial prosperity.

The field of comparative medical science is perhaps the broadest field that young men may enter and with a deep sense of appreciation I speak of my distinguished late fellow-member, Leonard Pearson of Pennsylvania, who coined the name "Animal Engineer," and for the field of comparative medical science that of "animal engineering."

The field of veterinary science is no longer a limited one of mending the broken parts of the animals that come within our domain but the richer, broader work of controlling animal diseases throughout the earth; the saving of nations from the great economic losses by animal plagues—the records of which precede the story of the earth as told by the Bible. The field of animal food inspection that must determine the physical strength; the freedom from diseases; the happiness and prosperity in great measure of the people of every land on the face of the globe. The study of animal food problems and their best methods of uses, means, indeed, the determination of commercial wealth and prosperity of those engaged in agriculture and animal husbandry.

To you, members of the graduating class, I congratulate you on your entrance to the veterinary profession at this, the initial period of its true growth and development. I congratulate you for the spirit of unselfishness that has controlled your minds in selecting this field of service for your life work. The field of veterinary medicine is not an avenue to great wealth. It does not even assure a competence in old age or in the evening of your lives. It does afford beyond all, an opportunity to contribute to the well being of your fellow man and an ever changing field of scientific advancement that will afford an outlet to all your energy, all your desires of investigation and bring to you the rich reward and realization that you have added something for the betterment of mankind and much to the true growth of commercial prosperity of the people among whom you will spend your future lives. While trying at times, and severely taxing your vital powers, there will come a rich return in the feeling that your work has much beyond its pecuniary value to the well being of your fellow-men. In the swift changes of the commerce of the earth and the restrictions along many lines for employment of one's education, training and ability that will afford an outlet for the same, without subordinating oneself entirely to the control of others. The field of your work will at all times enable you to be a good citizen and devoted

worker in determining all the great and complex problems that confront the true solution of national, state and municipal government and make you a factor in the world's progress along these lines as you may elect to be. Your own country, as well as mine, never in their history needed stronger men than they do this hour, and the independence afforded you by your adopted profession should make you greater and greater factors in the true development of our sister nations.

Your school, under the fostering care and support of your provincial government has better equipped you than any of your predecessors and has equally laid upon your shoulders greater responsibilities than upon those who have preceded you. The world is a justly exacting world, and when you have finished your work, it will not be measured merely by the standard that you have attained, but whether you have rendered in return all that was within the scope of your ability. You owe them the deepest interest in everything that tends to the advancement of your own calling, all that will contribute to its greatest worth to the individual, the community, state or nation and with the rich endowment which it has been your good fortune to receive, I have no doubt that you will render a just and adequate return.

For the second time in the history of the American Veterinary Association, now almost at the end of fifty years of continuous service, it will, in August next, make its second bow within the domain of your provinces. It comes in its greatest strength and power and at a time when its support, usefulness and worth has made itself felt as a strong power for great good to all the people within the boundaries of America. It comes to this city with a membership of more than a thousand interested and devoted men, and I am sure that if one part of the great good achieved by its first meeting in Ottawa is attained at this convention, it will more than repay every devoted attendant at the meeting, whether he comes from the shores of California or the Gulf of Mexico, or the Atlantic Slope. The splendid results attending our first meeting within your territory added a strength to our organization that has brought the rich-

est return. And if I may but refer to one achievement—the report of the International Committee on Animal Tuberculosis—rendered at San Francisco in September, 1910, whose work was a product of the directing force of your distinguished veterinary Director General, J. G. Rutherford. The association by this one attainment warranted all its previous years of effort and service to the profession and our common country.

This association as well as kindred organizations should at once attract you and win your support and interest. They are the channels through which our most effective influences may be exerted. They represent the altar upon which our contributions may be placed and from whence their benign influences may be spread throughout the veterinary world. It is the place and forum where every advancement and achievement may be thoughtfully weighed and considered and where the richest and most imperishable monuments may be reared to mark your worth and value to the profession and among the progressive people of the earth. Among its records may be written every triumph of your skill and services, that make the priceless history of the progress of every occupation and field of labor of man. The names of Michener, Liautard, Law, Huidekoper, Smith, McEachran, Pearson, Salmon, Rutherford, Harger, Dalrymple, Dinwiddie and many others are ineffaceably written upon the progress of veterinary medicine, in America, and make up an important part of the records of our Veterinary Associations.

In your own country the Veterinary Association of Manitoba has been foremost in the best work done for united action of the profession. In that province the best laws for her people have been enacted. No province in your own country and no state in mine has done more to encourage the best growth of the profession and given greater security and protection to her people and the live stock interests.

In conclusion, permit me to say that I know of no keener pleasure or delight, than to say to your institution and of your goverment that we in the states owe, indeed, a great debt for

the many young men educated under your fostering care. My native State of Pennsylvania, the keystone of the arch, has received more than one hundred and fifty of your graduates.

Our country as a whole has welcomed to its forty-seven states more than 1,700 men educated from the institutions from which you are about to emerge. Many of this number have rendered distinguished services in every aspect of our work, and the broader field for your employment welcomes you equally to as distinguished services and assures all of you a just and generous recognition for every help and aid you may give to the progress of the "world's" work. I therefore bid you a hearty welcome to the ranks of the profession whose work I have personally enjoyed for more than thirty years. I thank most cordially your principal, instructors and teachers for the equipment they have guaranteed to you and to the nurturing care and deep interest which the provinces of Canada have ever shown in the development of veterinary medicine and the recognition of the members of the veterinary profession in places of honor and trust for which I am profoundly grateful, and bid your country on to greater service and achievements.

In a recent communication from Dr. D. D. Keeler, Salem, Oregon, he writes: "I felt like throwing up my hat when I read the article in the Review from the learned Dr. Arthur Hughes; especially where he defends at least in a little degree, and I think in a very large degree, the progressive non-graduate; not that there are any excuses nowadays for anyone not to have a good and sufficient diploma, and I do not have any sympathy for a young man that starts out in life to make the veterinary profession his lifework that does not credibly obtain such a paper or diploma from a regular accredited veterinary college; but the point I am after is this: to have such a good defense and so ably championed for us poor fellows that could not fifty years ago obtain such credentials, but have and are still trying as best we can to keep abreast of the times, if to do so does cause us to burn sometimes a good deal of midnight oil. Here is one old fellow, Dr. Hughes, wants to say thank you."

REPORTS OF CASES.

A FEW SELECTED CASES OF COLIC.*

By J. H. McLeod, Charles City, Ia.

I present to you a few selected cases; they do not, as presented, form a general plan of treatment for intestinal colic, but are rather exceptions to my general line of treatment, if it may be so called; and in each instance were rather desperate cases, and in each instance, except Case 3, terminated favorably, considering the symptoms and the drugs exhibited in treatment of same. It might be said here that in notes that were taken in about thirty cases of intestinal colic, in which the sulphate of morphia was given subcutaneously in treatment of such; that in probably 85 per cent. of the cases thus treated, the results obtained were not in favor of the drug, and this drug was exhibited only when other means were deemed unnecessary or had failed to bring about an abatement of the distressing symptoms.

Case 1. Aged gray workhorse, semi-draft type, brought to hospital afternoon November 10, presenting symptoms of subacute intestinal colic; pulse good, somewhat fast but strong, bowel murmur absent, the external appearance of abdomen normal, rectal examination revealed nothing unusual. Gave Mulford's colic drench in linseed oil, and warm injections; one hour later horse appeared in about the same condition; gave 1 gr. arecoline; from this drug got copious salivation and increased intestinal murmur; a small quantity of fæces and flatus were passed, gave warm injection, and later 2 grs. eserine, 3 grs. pilocarpine; 3 hours later no improvement; horse appeared in much pain. At 11 p. m. gave hypodermic sulph. morph. 3 grs. atropine ½ gr.; in twenty minutes he was eating hay, passed urine and cleaned up two quarts of wet bran; on the morning of the 11th he had apparently passed a quiet night, but still showed symptoms of colic; gave quart of raw oil, two drams fld. ext.

*Presented at Iowa State Vet. Med. Assn. Meeting, January, 1911.

of nux vomica. No change at noon, on account of the weaker condition of the pulse, gave pulverized nux vomica, four drams ammon. carb., 1 dram in two capsules; also about 8 gallons of warm rectal injections, most of which was expelled. His condition remained about the same all day. At 11 p. m. no improvement; two more capsules as above, pv. nux vomica and ammon. carb. and warm injections; and later, before leaving him for the night, gave 6 drams chloral hydrate; next morning, the 12th inst., horse apparently much worse; had had a bad night and was throwing himself violently. I gave hypodermically, sulph. morphia, 5 grs.; when quiet, he was fed two quarts of wet bran and a fair ration of hay, which, being free from pain, he ate greedily. No action of bowels, no bowel murmurs, pulse much steadier and stronger since giving the morphine. Rectal examination revealed nothing; horse appeared very drawn in flanks and badly bruised; during the 12th, gaining apparently; gave no medicine, only injections. Towards night getting worse, sitting up on his haunches often, and in this position seemed to get relief; later on, same night, the animal looks bad all over; looks like a hopeless case; gave sulph. morph., 4 grains, and again he commenced eating a ration of wet bran and hay; left him for the night eating as if apparently well; 13th, a. m., still in pain, pulse weak, anxious expression, hurried breathing, no bowel murmurs, gave per jugular 15 grs. barium salt, but later was compelled to give hypodermic of morphia to modify action of the salt, so severe was the violent effort at defecation and consequent straining produced by the drug. Gave raw oil, spts. ammon. aromat. and fld. ext. nux vom. in a drench. Again he drank some water and cleaned up his ration of wet bran and hay. On the night of the 13th he passed a small quantity of foul smelling fæces, and from now on all medicine was withheld and he gained slowly. On the 15th he was sent to a small pasture adjoining the city. Two days later the owner called at the office, stating that he was again sitting up like a dog in the pasture and was rolling around in pain. Those symptoms were abated wth morphia, 3 grs.; raw linseed oil, 1 quart; fld. ext. nux, 2 dr. The animal recovered and is working every day.

Case 2. A sorrel driving horse, 12 years old, just off a 40-mile drive, with a history that during the day he had shown signs of colic and that the stable man at a neighboring town had given him some aconite; had refused his noon feed, had been

scouring some on the drive, and evidences of such were visible on his tail and hocks. Gave him promptly morphia, 3 grs. atropine ½ gr.; one hour later no improvement, the horse was ordered out of the livery barn to the hospital. Examination revealed temp. 103, pulse weak and fast, respiration hurried; he did not attempt to lie down, walked the stall continually except when tied up; covered with cold sweat, ears and legs cold. Rectum empty and ballooned. Gave a drench of raw oil, ol. terebinth, ℥ss, eserine, 1 gr., pilocarpine, 1 gr.; I stayed with the horse for the next five hours, and during this time there was not a moment of ease, walking continually. Used turpentine stupes and warm injections, and put him on Reeks' stimulative treatment, and left him in pain. Next morning the animal was not in quite so much pain, but still desperately sick; the pulse, however, was good enough to still stand active treatment, so gave arecoline, 1 gr., and later kept up the stimulative treatment. No evacuations from the effect of the arecoline and but slight salivation. I decided to give no more active purgatives. About six hours later the animal had a small passage and recovered slowly. Three days later discharged from hospital.

Case 3. A bay draft gelding, working daily on new railroad grade; called late one evening in October, presented the usual symptoms of intestinal colic; did not appear to be a bad case, there was slight tympanitis; neither owner nor the driver present, so that no information could be obtained. Gave at once drench of ol. lini and terebinth, morphia, 5 grs., atropine, ½ gr., with instructions to watch him carefully, and call me again if necessary. Was notified by 'phone one hour later that the horse was eating and apparently all over the colic. At 6 a. m. called to see him again, he is now in much pain, abdomen somewhat distended, no peristalsis, rectal examination found rectum empty, the intestines, especially to the right of rectum, packed to their full capacity, with the peculiar tinkling sound on auscultation. Temp. 102, pulse 110, respiration 28 to 30. You will have no difficulty in arriving at an accurate diagnosis now, and you will agree with me that the prognosis is very grave and doubtful; however, I immediately tapped the bowel, the accumulated gas rapidly escaped, burnt with a blue flame; the animal was given a drench of oil and turpentine and hypodermically ¼ gr. eserine, 1½ grs. pilocarpine. I was called in the country shortly after this, but was informed that he was dead on returning; died at 3 p. m. second day.

Case 4. Asst. (Hughes) case. Black driving mare, called at 6 p. m., presenting the usual symptoms of colic with gaseous distention. Gave with syringe ol. lini, 1 ounce, Mulford's colic drench and terrelruta. One hour later above treatment of no benefit, about same amount of tympanitis, gave arecoline, 1 gr.; in 30 minutes no better, abdominal distention more pronounced, tapped the bowel, got immediate relief and one hour later was eating hay and apparently well.

Next morning was again consulted in regard to this mare; on backing her out of the stall it could be seen that on the right side of head, appeared a large swelling extending from the nostrils and angle of the mouth to the base of the ear, and extending back lower down to and involving the pharynx and larynx on the right side; left side normal; mastication difficult. The owner was informed that the mare would be dead in about two days, that the case was one of malignant œdema, with everything against recovery; no treatment was attempted; the mare died at almost the time above stated.

Comments and conclusions: Case No. 1. Would certainly have died had it not been for the sedative administered.

Case No. 2. The chestnut horse got well in spite of the sedative but I believe you will agree with me that sedatives administered to cases of like history and symptoms, are not contra-indicated.

Case No. 3. Black mare had the germ of malignant œdema for some time before the colic, and this probably was the predisposing cause of the attack.

Case No. 4. Might have made a recovery if the sedative had been withheld and active purgation and injection persevered with during the night.

EXPERIENCES WITH THE STOMACH TUBE IN COLIC.*

By H. B. TREMAN, Rockwell City, Ia.

At nine P. M. Thanksgiving Day, I was called eight miles in the country to a case of colic, with the request to hurry, as the owner was afraid the horse would die within a short time if he

* Presented at the Iowa State Vet. Med. Assn., January, 1911.

had no relief. When I arrived I found there was sure enough need for haste, as the poor brute was about all in, was terribly bloated, as wet as sweat ever makes a horse, with that expression of agony so familiar to all of us. He was regurgitating every few seconds, and considerable of the contents of the stomach was being discharged through the nostrils, as near a vomit as a horse usually gets.

I left my team to the care of others and passed the stomach tube as quickly as possible and a description of what I got out through that tube is hard to give. It was quite thick, very bloody and foamy, containing a small amount of ingesta; it was so bloody that I believe there was anywhere between one and two pints of blood in the stomach and it gave the appearance of having been energetically churned for some time; while we did not take time to measure the amount taken out, yet I believe we got considerable over a common bucket full, and the *odor!* well, it drove one man out of the barn and another had to take a chew before he could stay longer and help. Before removing the tube I pumped in nux, turpentine and eucamphine. While this gave considerable relief, both from pain and symptoms, yet it was by no means complete. I gave heart stimulants, hypodermically, also a small dose of arecoline, hoping to hurry things on and get relief through the natural passage; but in this case I believe that was a mistake because of the pain and the depression of the heart, also the abundant secretions which the tired and distended stomach could not handle so soon after its engorgement, and there being no particular bowel trouble, I do not now think arcoline was indicated.

The patient continued in pain with frequent retchings, as though choked until 3 A. M., when I again passed the tube and got something more than a bucket full of liquid; though bloody, it was much better in appearance than at first; after this the horse was very quiet and depressed, after which recovery was very rapid.

While this case is neither new or startling to most of you and I could recite the history of many cases somewhat similar, I selected this case in order to emphasize the use of the stomach tube, which I believe is one of the greatest mechanical means of treating disease we have. I am convinced that no amount or kind of medicine that could have been emptied into that stomach or injected into the system of that particular horse would have effected a cure. Nevertheless in conversing with different vet-

erinarians at recent association meetings, I have been surprised to find so many who seldom if ever use a stomach tube. The fact that so little has been written and said about the use of the tube (aside from commercial agents) I think accounts largely for so many being timid or slow about beginning its use.

It is now five years since I began using one and I have had quite a varied experience since that time. The first one I used was the hose to my injection pump, about six feet long, but did some very effectual work on a few cases. Other tubes have varied from soft rubber tubing to small garden hose. One of them of course was a $15.00 one. Right here I will say just a word about the Kinsely tube. I cannot agree with the doctor about the great superiority of his tube over the single tube, all things considered, but I do think the doctor deserves great credit for bringing the use of the stomach tube in general, so prominently before the profession.

The first few times I used the Kinsely tube, I was disgusted to say the least, it being so unhandy to carry the cumbersome speculum along for a case of colic; besides, the patient would breathe much harder and resist the procedure much more vigorously than passing one through the nose. Later I used a method (which I have reported before) of buckling the jaws together and passing the tube through the interdental space. This method I used altogether as long as I used the Kinsely tube. It is too large to make a practice of passing it through the nostril in all kinds of horses, it also being large, the œsophagus often holds quite a firm grip upon it, making it necessary to have a stilet in order to pass it at all. So many appliances, all for one operation of the kind is rather unhandy, if you count the convenience of carrying, handling, passing, etc. I very much prefer the single tube; many times while using the double tube I have discarded the secondary tube and used only the large one as a syphon, believing it worked better that way. A short time ago the small tube on mine sprung a leak and I peeled it off and now I have the best working tube I ever saw; it will allow a whole grain of corn to pass out and yet it can be passed through the nostril without the use of a stilet, except in a few cases, and is not at all cumbersome to carry in the buggy all the time.

As to the technique of passing the tube, I will say a few words for the benefit of those who have had little or no experience. The first step is to make the tube slippery; as oil is very

hard on rubber it is advisable to use an infusion of slippery elm bark, or in most cases one can by inserting the hand into the mouth get enough saliva to answer the purpose very nicely. Next have an assistant hold the head firmly, pass the tube up along the floor of the nostril, it is very important to keep down on the floor well into the grove below the superior maxillary bone, thus avoiding the tuburated bones and the consequent hemorrhage; when the tube reaches the pharynx the patient will involuntarily swallow, then, if you are "Johnny on the spot" and quickly shove in about 4 inches of tube you will seldom fail to enter the oesophagus, but if too slow you will usually enter the trachea; but remember the old adage, "if at first you don't succeed, try again." Then by proceeding slowly the patient will usually swallow it from now on without much trouble, though occasionally it has to be pushed clear down.

Another difficulty sometimes experienced here in cases of engorgement of the stomach with grass, oats, or such food, is just before the tube reaches the stomach, it will stop, owing to the pressure on the œsophagus by the stomach itself, and you will be unable, any way you choose, to pass the ordinary tube on without a stilet or something to answer that purpose. A small wire used double, the doubled end first, makes a very satisfactory stilet and is very convenient to carry. In such cases this is very important because if the tube does not fully enter the stomach and water is pumped in, the water readily finds its way on into the stomach and you will be unable to get any return and consequently you have only aggravated the trouble already there.

There is another condition which is often baffling, when one pumps in considerable water and fails to get returns, the water disappears and I have been led to believe in several cases that the stomach was ruptured, but learned it was not, for the patient sometimes recovered. I believe the tube enters the stomach in such a way that the water passes direct into the intestines much the same as when a horse drinks several times the amount a stomach will hold.

There is another use to which a tube can be put; while I have never done it myself, my brother has in several cases, with very gratifying results; that is, in impaction of the bowels; simply pump 3 to 6 gallons of water into the stomach and follow with a full dose of eserine or arecoline, thereby more fully liquifying the bowel contents and wash the offending obstruction on out.

AN INJURED FOOT IN A MULE—SURGERY AND BACTERINS.

By Dr. W. WARREN, Sedalia, Mo.

The first case to which I call your attention will demonstrate the uselessness of using bacterins until you have given the case what surgical attention it needs in order for nature to effect a cure. I believe bacterins will assist nature to more quickly overcome a suppurative condition, but it will not remove causes that arise from traumatism.

On May 16, 1910, a gentleman called in, from 16 miles in the country, stating he had a mule that had hurt his foot in a run-away about five weeks prior to this time, and wanted something done for it. I was away at the time, so Dr. Woods Morgan, who was assisting me, went out to see the mule, and when I returned he reported that he found a pretty badly injured foot, with pus discharging from the sole of the foot where it was injured, and also discharging at the coronet. He pared it out as best he could, and left some antiseptic dressing, and asked the owner to report in a few days if the mule was no better.

On May 23d the owner 'phoned the mule was no better, and the discharge was growing more profuse all the time. I told him to bring the mule to town if possible, that I could not do much with it in one or two visits and it would be much cheaper for him to bring it in, and more satisfactory, as I could then give it my personal attention all the time. He did not think the mule could possibly walk to town, and knew he could not load him in a wagon and haul him, as it was an unbroken three-year-old mule. I told him I thought it would walk in if he gave it plenty of time, so on May 24th he brought him in.

It being dark when he arrived, I did not examine the foot until the next morning, when I found a very profuse suppuration from a wound in the sole of the foot at the point of the frog, also from two openings above the foot at the border of the lateral cartilage, and at the margin of the heel, in the right hind foot. On probing the foot I could feel that the bone was injured, it seemed to be split up through the os pedis just anterior to the attachment of the perforans tendon. The sensitive lamina was sloughing from quite an area about the injury. Foot seemed to pain the mule very severely, as it would not touch it to the ground unless compelled to move. The general condition

of the mule was good considering what it had suffered. Temperature about 101, pulse not disturbed very much, and general appearance not bad, but did not have much appetite.

The hoof being very hard and dry, I decided to poultice it a day or so before trying to operate on it. Being very busy at that time, I did not get around to operating on it until June 2d, when I cast the mule, removed all the sole and frog that was dissected loose by the pus, and removed a piece of the os pedis about the size of the end of my thumb, of irregular form about one-half inch through each way. Probed for fistulus tracts leading from this up through the foot but could find none, curetted the wound thoroughly, applied iodoform and compho-phenique dressing and let the mule up.

This did not seem to cause any let up in the pus discharge, so on June 17th began using poly-bactarins (Abbotts).

On June 22d I recast the mule and probed for fistulas up through the foot, found one leading up the inside of the external lateral cartilage, with two external openings. I removed the cartilage and curetted all the necrotic tissue I could find, dressed the foot and let her up, and gave the second injection of bactarin. In June 24th the owner came in and found all appearances about as when he brought the mule in, so he ordered me to kill the mule and stop his expense. I told him he could settle up to that day, and his obligations ceased, but I was not ready to kill the mule, and if at any time in the future he felt that the mule was worth redeeming at 50 cents a day from that time he would be at liberty to do so. I wanted to see what I could do to help nature repair the injury, and would risk getting out on the mule. So he settled up and wished me good luck and left it with me.

On July 4th, gave third injection of bacterin; July 10th gave fourth injection, and July 16th the fifth injection. Mule still would not touch foot to the ground. Appetite was better, discharge not quite so profuse but still plenty of it. Seemed to be burrowing just under the skin and breaking out at places along the margin of the hoof, but was not under the deeper structures at all; would dry up in a week or so, and break out a little further around toward the inside.

About this time I prepared some autogenic bacterin from a fistula of the withers, and thought I would try it on my mule; so on July 21st gave first injection, July 27th second injection.

and August 8th third injection. But still did not have any perceptible improvement.

On August 9th cast the mule and examined the foot carefully, found the wound from which I had removed the cartilage was doing fine, no fistulas in that region, but bottom of foot about as it had been; removed all the new, spongy sole, and curetted the injury in the bone but could not find any indications of more bone loosening up.

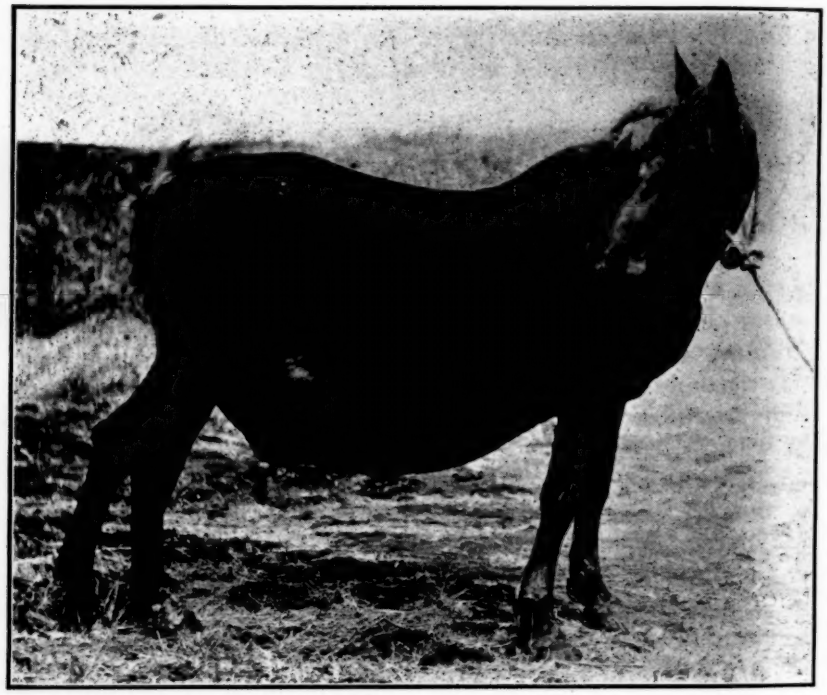
On August 16th gave the fourth injection of the fistula bacterin and decided to just let it alone for awhile, only to keep it clean.

By September 20th the lameness had subsided quite a good deal, the appetite was fine and the mule was putting on some flesh, but still would not place any weight on the foot. At this time I prepared some autogenic bacterin from the foot, gave injections of this September 20th and 29th, October 9th and 18th. Lameness and discharge seemed to make pretty good headway for a time but still hung fire and would not cease discharging. About the 1st of November the lameness seemed to get worse, discharge about as for some time. I decided that the bone must be the cause of my trouble, as the swelling about the top of the foot was about all gone, and no discharge excepting at the point of the frog. So I decided to take a look at that bone if it killed the mule. So on November 2d I cocained the foot, cast the mule, put a tourniquet on the leg, removed a pretty good space from about the opening through the sole, removed the tissue from the bottom of the foot until I could see the bone; I found there was quite a piece of dead bone that had not become loosened from the healthy bone. I took a gouge and worked it loose and removed it. It was about the size of a quarter of a dollar, and about a fourth of an inch thick; I then curetted the space thoroughly, and let the mule up. After about a week the lameness began to subside again, but still some discharge. On November 22d I began using Mulford's Bacterin, giving injections November 22d and 27th, December 6th and 16th. When the discharge had ceased. On January 14th the owner came in and redeemed the mule and took it home. It still showed a little lameness when trotted, but the foot looked nearly as good as any of the others, just a very slight thickening about the coronet, and I believe it will make a complete recovery and sell for sound within six months.

RUPTURE OF THE PREPUBIAN TENDON IN PREGNANT MARE.

By A. T. EVERETT, V.S., South Omaha, Neb.

REVIEW readers are indebted to Dr. Everett, of South Omaha, for the splendid illustration below, made from a photograph of a patient, which the doctor states was in the tenth month of



T denotes altered position of teats.

gestation. He says that "between the teats it had broken open and was bleeding some from the wound." He gave a grave prognosis, and the mare died two days later.

DYSENTERY IN CALVES.

By Dr. W. WARREN, Sedalia, Mo.

About a year ago I was called into different neighborhoods to see bunches of calves, 8 to 10 months old, suffering with a form

of dysentery. One man had 6 calves, had lost two of them and had one sick. Calf had the appearance of having been in good living order when the disease made its appearance; was considerably gaunted, eyes rather sunken appearance, hair did not look bad. Temperature about 102, respirations not disturbed, pulse about 70, no appetite. Stood with its back arched some, and had frequent evacuation from the bowels, without any particular expulsive effort, of a thin dark colored discharge, mixed with some mucous, and considerable blood with every evacuation. Had been running on timothy stubble pasture through the day, and was fed a small ration of grain with some corn fodder at night and mornings. Another bunch of about 30 calves, the same age, 10 miles from this locality, was attacked in about a week later. When I was called, there were 7 or 8 affected, with the loss of one. Presented about the same appearance as described above, excepting that two or three of them had temperatures ranging up in the neighborhood of 103 and 104 degrees, and showed slight pain when the bowels moved, and at times pretty profuse hemorrhages. They were running about a straw stack of wheat straw. Fed a pretty strong corn ration with some fodder to pick at. Watered from a well with windmill, had good protection from the changes in the weather.

In a few days I was called to another neighborhood, in an opposite direction from town, about 20 miles from either of the other bunches. The man had about fifty head; think he had bought most of them on the Kansas City market some two months before this trouble showed up. They were running on a blue-grass pasture, fed timothy hay and a good strong ration of corn, had good protection and were in good flesh. He had three affected and had lost one. They presented about the same symptoms as the above described, only one of these seemed to want to lie down most of the time, and all the others that I had seen seemed to want to stay on their feet.

All these bunches had been affected four or five days when I saw them; in the ones that had died the symptoms appeared first, and had run their course in about a week, and the others began to show up in four or five days after the first one, and all at about the same time. Then the owners would become frightened and call in help. I could not find any satisfactory cause for it in any of the bunches; it had the appearance of an infection. I did not have an opportunity to hold an autopsy to determine the ex-

tent of the lesions in the bowel. As the calves that had died had been destroyed by hogs, before I was called to see the ones that remained. They all had good clean feed and range so far as I could determine, and good water supply. And there had been no calves brought into any of the bunches near the time of the attack. I confessed to the owners that I felt unable to say just what was causing this trouble. I advised them to separate the sick ones from the others at the first appearance of the disease and if possible to change the well ones onto a clean range and feeding grounds for a time. To cut off all grain rations from the ones affected, to give a raw egg in a little cold water three times per day and give a cup of flour once per day in a bottle of cold water. Gave about a half dram each of powdered nux vomica, dried sulphate of iron, and naphthaline, with a dram of sod. bicarb, 3 or 4 doses per day 4 hours apart. Gave rectal irrigation to be administered as far up into the bowel as possible, of a tablespoonful of sod. salicylate in a half gallon of hot water, twice per day. The flour to be discontinued as soon as the bowel seemed to be responding to treatment. The rest of the treatment to be continued so long as necessary, and to use great care in getting them back onto feed after recovery. Lost one in the second bunch mentioned, otherwise had a good recovery in all the cases treated. The strange part of the matter to me was that the outbreak would show up in several at near the same time, and be no further development of the disease. And there was no complaint from any one in the neighborhood of the bunches which I have mentioned.

PULMONARY DISTOMIASIS.

(*An abstract.*)

Dr. Henry Hanson of Milwaukee, Wis., has recently reported the finding of the lung fluke (Paragonimus Westermanii) in the lungs of several family cats (a mother and her offspring).

The symptoms of the cats were those of a choking cough which gradually grew worse; loss of weight was a prominent feature.

At autopsy the lungs appear normal color, except at their bases where colored nodular areas are noted. As many as eight

cysts were found in one case and in each cyst usually two parasites.

The Paragonimus Westermanii were found in hogs slaughtered at an abattoir in Cincinnati by Dr. Claude McFarland, who was on the killing floors inspecting at that time. Later this report was published in an annual report of the Bureau of Animal Industry.

This fluke has been reported twice before in the United States, once from Ann Arbor in casts, and once in Columbus, Ohio, in dogs.

Dr. H. D. Moore, Rapid City, S. D., has gone to Frankfort, Kentucky. His genial countenance will be recalled by all who were fortunate enough to be one of the party on the American Veterinary Special to 'Frisco last September. The doctor assures us he will be with us again at Toronto in August.

Horses Only for the Coronation. A special cable from London says the Master of the King's Horse is having all the animals to be used in the coronation procession specially trained. The course includes making the animals accustomed to all sorts of sights and sound, and they are not considered fit until flags can be waved in their faces, guns fired at close quarters and shouting crowds paraded in front of them without making them restive. The Royal Riding School is a noisy place during practice. Loud-voiced youths rush about yelling and waving brightly colored flags, rifles are fired and a miscellaneous band makes all sorts of hideous noises. When the horses can stand all this without flinching they are reported as fit. The idea is to avoid the spoiling of effect by some unlooked-for and unrehearsed incident. In the past, training of this kind has been proved to be absolutely necessary. It is also reported that the edict calling for horses only in the procession and other royal functions has put some comparatively impecunious personages to great distress because, having discarded horses for motors, they are now obliged to pay exorbitant prices for horses to replenish their stables.—*Rider and Driver.*

ABSTRACTS FROM EXCHANGES.

ENGLISH REVIEW.

By Prof. A. LIAUTARD, M.D., V.M.

ANTHRAX AMONG WILD ANIMALS IN CAPTIVITY [*F. Sommers*].—While traveling, the Bostock and Wombroelles show had a sad experience. Two raccoons, one coypu, and one English badger were found one morning dead. The next day two pumas and one leopard were also found dead. Anthrax was pronounced the cause of it by Prof. McCall. It was feared that more trouble would follow and indeed soon three polar bears were showing symptoms of gloss anthrax: tongue swollen, and protruding from the mouth, dark pink or black bluish in color. Hyenas, polar and brown bears were also diseased. One lioness died. Some of the birds were sick, principally one large vulture. Other animals showed symptoms also, but recovered. The general symptoms besides the condition of the tongue were congested, blood-shot eyes, swelling on the dew lap, the throats were swollen. The birds had a most pitiful appearance, their feathers sticking out, head drooping, muscular twitchings all over the body. Some kind of general treatment with cod liver oil, chlorate of potash was carried out as best as could be. Antiseptic measures, however, formed the principal indications. It seemed that the menagerie had fed the stock on raw meat, undoubtedly anthracoid; but as the meat had come from various sources the origin of the outbreak could not be traced.—(*Veter. Record.*)

AN UNUSUAL ABSCESS [*Arthur New, M.R.C.V.S.*].—Under that name the author relates the case of an abscess which he had occasion to treat in a cow. She had a swelling on the left side of the chest, between the shoulder and the elbow. The animal was very lame. After the application of liniment for several days, the swelling became soft and fluctuating, it was lanced. On

feeling the inside of the cavity of the abscess a piece of umbrella frame, five and half inches long, was extracted. Good recovery followed.—(*Ibidem.*)

INTESTINAL FISTULA IN A HORSE [*Wm. Hunting*].—This animal had an œdematous swelling under the abdomen. It increased and extended forward between the fore legs. Later it became defined to near the prepuce, then more circumscribed and finally softened, broke and allowed a large quantity of pus to escape. With the pus were mixed ingesta and some of those were found in the cavity of the abscess. With care this healed but after a while other abscesses formed again, but this time instead of one, there were two. It was quite clear that the trouble was due to an intestinal fistula. The two abscesses communicated and the finger introduced in them could feel an opening going into the abdomen. After a few days the general condition of the animal seemed to feel the effects of this state of affairs. The appetite was lost, the temperature rose to 104, the breathing became quick, in fact all the indications of peritonitis were present. Some water being given to the poor beast, after a few minutes, a fair sized stream of dirty fluid gushed out of the fistulous opening. At the post mortem, with the opening into the cavities of the abscesses and connected with them, there was found a firm adhesion of the ileum about 18 inches before it reached the cœcum. The portion of the gut in front of the adhesion, where the intestinal opening was, showed slight inflammation and the portion posterior to it was quite healthy.—(*Veter. Record.*)

PARALYSIS OF THE PHARYNX IN A HORSE [*Henry Taylor, F.R.C.V.S.*].—Aged animal which had all the symptoms of paralysis, nasal discharge mixed with food and saliva quite frothy, with impossible deglutition of either solid or liquid. Apparently in good health, looking bright, with normal temperature and pulse. After about ten days of sickness he showed gangrene of the lungs and died. Post mortem revealed that the mucous membranes of the pharynx, larynx, right guttural pouch, and trachea had a black appearance. Unfortunately the lungs were not examined and the autopsy remained incomplete.—(*Ibidem.*)

CONSTRICTION OF THE LARGE COLON [*Lieut. H. C. Stewart, A.V.C.*].—Interesting lesion found at the autopsy of a horse

which died quite suddenly after a severe but short attack of colic. His temperature taken when he became comatose was 110.4° F. The thermometer was tested and found reliable. The constriction of the colon was found at the point where the large runs into the floating colon. It measured two feet in length, was ⅛th its normal size, with thick walls and mucous membrane inflamed and corrugated. It was about the diameter of a piece of small intestine. When the end towards the large colon was slit and the fœces beyond pushed back, gas was heard to escape, the fœcal matter was hard and normal. On slitting the other end, very little fœcal matter was found although the floating colon was normal. The horse had had previously several attacks of intestinal troubles for which he was laid up more or less.—(*Veter. Record.*)

A Case of Black Quarter [*H. Blouet Nixon*].—Called to see a heifer, aged twenty months, for a swelling which she had in the right axilla, and which was diagnosed as the first stage of a case of black quarter, the author prescribed a stimulant drench and started to go and get blackleg pellets. He dissolved ten of these in warm water and injected them in the painful swelling in three places. He also inserted one blacklegine cord in the tail. After a few days the condition of the animal seemed to improve and nine days after the animal was turned out to graze. She soon was pushed in food, received fattening ration and a few weeks after was killed, weighing "26½ scores which, said the writer, is a fair weight for a two-year-old heifer of small frame."—(*Ibidem.*)

Anaemia of Colts [*W. F. Richardson, M.R.C.V.S.*]—Called to treat a two-year old colt in which anaemia by scleros tomata had been diagnosed, the writer put the animal under the following treatment: Liberal amount of corn and hay, one ounce of liq. arsenicalis night and morning, powder of 2 drachms of chlorate of potash and two of nitras at midday. After a fortnight worms began to be passed in considerable quantities with the fœces. About a week later, the arsenic was dropped to one ounce a day and powder given in place with arsenic and sulphate of iron. Anaemia disappeared, appetite returned, general condition rapidly improved.—(*Ibidem.*)

Clinical Notes [*W. Graham Gillian, M.R.C.V.S.*] *Gastric Impaction.*—Mare, six years old, had great colicky pains, is put

under treatment and got temporary relief. After a few hours she is bad again and rather than to destroy her, as the owner asks so as to relieve her great agony, she is given two grains of eserine salicylate intra-tracheally. She had severe vomiting from it, passing a great quantity of food, and then she became easier. The next morning she was convalescent. This is the third case of vomiting seen by the author, where recovery has taken place. Vomiting is not always associated with rupture of the stomach and death.

EVERSION OF THE BLADDER.—In slipping her foal, this mare had eversion of the bladder. It was difficult to reduce it although the urethra was much dilated. Morphia and bromide of potassium had to be administered and the writer had to keep his hand over the meatus for some time. The temperature of the animal was 103°. Straining continued during the night only and in the morning the mare was in her normal condition. "In text books "it is said that in such condition the urine is seen squirting in "two jets from the ureters; in this case the urine came merely "trickling over the everted bladder."

ULCERATIVE GASTRITIS—VOMITION—RUPTURE OF THE SMALL INTESTINE.—Gelding, seven years old, pronounced cribber, had what seemed to be an ordinary attack of colic. He has purged freely. Treated with colic draught and porphia, he gets worse and suddenly dies. Autopsy: Large quantity of blood in the abdomen. Stomach full of food with mucous membrane having a mass of crater-like ulcers. About 12 inches from the pylorus, there was a stricture of the bowels and between this and the stomach a very irregular tear three inches long. In the portion where the stricture was the lumen of the bowels was hardly large enough to pass an ordinary pencil. The mucous membrane was spotted with small ulcers similar to those of the stomach.—(*Veter. Record.*)

A CASE OF INTUSSUSCEPTION [*Lieut. R. F. Bett, A.V.C.*].—Bay mare, 13 years old, has had severe colic, and was treated with chloral hydrate. Twenty hours after this attack, the temperature rose to 105°, the pulse became weak, the animal dies. Post mortem: On opening the abdomen no cœcum could be discovered, but at its usual site there was an inflamed and enlarged mass of bowel. The cœcum had completely telescoped within the large colon and a great amount of traction was necessary to draw

it out. A small loop of the ileum had been carried in along with the cœcum. There was a rupture ½ a foot long at the great curvature of the stomach, probably of post mortem nature.—(*Veter. News.*)

HEMATURIA DUE TO SARCOMA OF OVARY AND KIDNEY [*E. H. Stent, M.R.C.V.S.*].—Aged brown mare is subject to attacks of hematuria. By rectal examination a very large tumor was revealed in the sublumbar region. The mare is destroyed. At post mortem is found a large sarcomatous ovarian tumor weighing 71 pounds and invading the pelvis of the left kidney.—(*Veter. Journal.*)

CYSTIC CONDITION OF THE SCROTUM [*Capt. E. S. Gillett, M.R.C.V.S.*].—Five-year old horse had a swelling in the scrotum, which was visible at times only and not constant. Cast for operation several cysts were found containing transparent fluid. The end of the spermatic cord was normal. The walls of the cysts were dissected out and astringent treatment applied. Uneventful recovery.—(*Veter. Journal.*)

RACEHORSE BREAKS ODONTOID PROCESS [*Norman Meyers, L. V.Sc.*].—This horse fell in a flat race. Death was instantaneous. There was a swelling in the region of the axis, which, on being cut down, showed a comminuted fracture of the odontoid process with splinters of bone in the spinal canal and surrounding muscular tissue. There was also hemorrhage and laceration of the spinal cord.—(*Ibidem.*)

ACETYL-SALICYLIC ACID IN CANINES [*Arthur Payne, F.R. C.V.S.*].—The author recommends the administration of this drug in 5-10 grains doses two or three times a day, particularly in cases of paresis following distemper, and also in ordinary paralysis of the hind quarters unusually observed in middle aged and old dogs. He records four cases illustrating the results he has obtained.—(*Veter. Jour.*)

CHYLOUS ASCITIS IN THE CAT [*Mess. Smythe and Smythe, M.R.C.V.S.*].—Six-year-old cat, whose diet had been the flesh of wild rabbits which he poached himself. He did not relish any other food. In six days, his abdomen has enlarged to such an extent that it is hard for the animal to move. It is a case of

ascitis. Paracentesis abdominals is performed and four pints of milk looking fluid are taken away. Microscopic examination shows it was a case of chylous ascitis. The animal had to be tapped again but finally was destroyed.—(*Ibidem.*)

FRENCH REVIEW.

By Prof. A. LIAUTARD, M.D., V.M.

CANCER OF THE KIDNEY [*Mr. Morel, Sanitary Veterinarian*].—In the many inspections that the writer has made at the abattoir of Hippophagy, he has had the opportunity of meeting several cases of cancer, among which this reserves special attention. Weighing 13 kilogramms, it was found in a mare forming an enormous tumor, involving the left kidney. The neoplasic mass was irregularly round, bosselated and of yellow coloration. Rather hard, it had contracted adherences forward with the stomach and the duodenum, behind with the rectum and uterus, on the right side with the liver and on the left with the spleen. Some remains of the renal pelvis permitted recognition of the kidney, but its form and shape were not normal, as it had been so much degenerated by the invasion of the tumor. The lymphatic glands of the renal region and specially the lumbo-aortic were much infiltrated and hypertrophied. The psoas muscles were much infiltrated. There was a thick œdema of the abdominal and inguinal crural regions and also thrombosis of the left iliac blood-vessels. The right kidney was hypertrophied and weighed one kilogram and 270 gramms. The mare in which this cancer was found was white and free from melanosis. She was in good condition of flesh and fat.—(*Bullet. Societ. Cent.*)

CANCER OF THE RUMEN [*Prof. G. Petit*].—This was found in a cow which had been slaughtered in the abattoirs of Luxemburgh. It came from the rumen of a cow and was the only one in the whole carcass. It is an epithelial cancer, malpighian epithelioma, similar to those that are found in the œsophagus, pharynx, etc.; in fact, on all membranes with pavimentous epithelium. There was nothing particular about the histology of the growth. But notwithstanding its large size it was singular that there has not been any metastasis in some other organs.

However there was one lymphatic gland rather hypertrophied in the neighborhood of the tumor, but it was not of cancerous nature.—(*Ibidem.*)

RHEUMATISMAL MANIFESTATIONS IN A DOG [*Mr. A. Vidal*].—This is only the simple history of an attack of acute rheumatism, which is interesting by its rather uncommon manifestations. Ten years old, this slut is suspected of rabies by her owner, as she laid down since 48 hours, refusing all food and is howling continually. Yet she is quiet, has an affectionate glance. If called she picks up her ears, moves the tail and tries to get up. When she is taken then with pains, howls, moans for a minute or so and then becomes quiet. She does not try to bite. There is no salivation, and she is not aggressive. She certainly has no rabies. Attempts are made to put her on her four legs, when she again has an attack of pains, howls, etc. Acute lumbar rheumatism is diagnosed. Syrup of morphia, revulsion on the loins and castor oil are prescribed. Improvement sets in the next day. Examination per vagina. reveals an enormous, hard, full bladder from which 400 C.C. of normal urine are extracted. The animal seems to enter into convalescence and an antirheumatismal treatment is prescribed for ten days. Two days later, relapse; neck and jaws are very sore. There is a large swelling on the neck and the jugular veins show venous pulse. At the femoral artery the pulse is filiform and the dog has great dyspnea. The rheumatism is localized in the cervical region and the condition of the heart shows that it is also involved. Mustard poultice on the chest, and caffeine improves the condition, and finally salol and bicarbonate of soda complete the treatment, which is at last followed by complete recovery.—(*Rev. Veter.*)

STRONGYLUS VASORUM CAUSE CEREBRAL EMBOLIES.—[*Capdebielle and Hussenet; Students*].—Fox terrier slut, since a week, has a capricious appetite; drinks only a little milk which she vomits. She has had epileptic fits. She is very weak; has a fœtid breath and her eyes are congested. Palpation of the abdomen gives rise to contraction of the muscles of the legs, twisting of the neck and eyes. Then she salivates much, passes urine and moans. The treatment consisted in disinfection of the mouth, and gastro-intestinal canal. Ten cubic centimeters of antistreptococcic serum were also injected. The slut died the following day. *Post mortem:* Acute inflammation in the

stomach and intestines. In the thorax, there are tubercular nodules in the thickness of the lungs in which there were found *Strongyli Vasorum.* In the brain there had been an hemorrhage indicated by a little clot of blood in which by microscopic examination, a living twisting and untwisting stronglyus was observed. —(*Rev. Veter.*)

Intestinal Invagination [*Mr. A. Picard, Army Veterinarian*].—Record of a post mortem made on a horse that died with colic after an illness of 24 hours. On opening the abdomen, the intestinal mass appeared very congested and distended with gases. A dirty looking peritoneal fluid escaped. The large intestine was full of fœces, very hard. The cœcum showed dark patches and a portion of the small intestine seemed to be pushed in the cœcal cavity. This being opened, there was found in it a large red sausage-like mass, about 40 centimeters long, which proved to be a part of the ileum. This invaginated intestine was inside œdematous and contained hemorrhagic inflammatory fiuid. —(*Rev. Gen. de Medec. Veter.*)

The Use of Cryogenine in Horses [*C. Lesbre and Bell,* Army Veterinarians].—Having recorded many failures in the use of acetanilid, phenacetine, antypirene, etc., and other antithermic agents, the authors decided to resort to the use of a new compound, the *Cryogenine,* extensively used in humane medicine and with advantage. Cryogenine is a metabenzamide-semi-carbazide, which among its principal properties is but soluble in a small quanitity in water, 2½%, is very soluble in alcohol, and at 5% in glycerine. It is perfectly innocuous and acts as an antithermic and analgesic by direct action upon the nervous centres.

After various trials, the writers found that the dose to which cryogenine could be administered was between 25 and 30 gramms at one dose and preferably given in electuary (why not in a bolus? The effects are manifested two hours after. The temperature of the animal gradually going down until it has reached two or three degrees below the one it had when it was given. Cryogenine ought to be administered at the very onset of the febrile movement and can be renewed if by exception the hypothermy would resist or if after a lowering down the temperature would have a tendency to rise again.

In some pneumonias, when the drug was given at the onset of the disease, this had been cut short. In resuming, the authors say: It acts on horses as a powerful antipyretic, has none of the inconvenience of other drugs, can be repeated several days in succession, and in pyrexia without localization well established will lower the temperature two or three degrees. In febrile manifestations of infectious origin its action is less complete or durable, is always beneficial by its analgesic action. Pyrexias which are not acted upon by Cryogenine are always almost justifiable of a serious prognosis. Unfortunately it is expensive.—(*Bullet. Soc. Veter. Scient. de Lyon.*)

ANAL ATRESIA IN A CALF [*Ch. Escofier, Army Veterinarian*].—A calf three days old, makes very violent expulsive efforts to defecate. He has no anus. The abdomen is very much distended. There is no indication of anal opening in the perineum but in its site a thickening of the skin. During the strains of the animal, the perineal region is bulging backwards and a slight fluctuation is felt due to the rectal diverticulum pushing under the skin. The calf is put on a table, in dorsal position with the front part of the body elevated. An incision is made on the skin, previously disinfected with tincture of iodine, the cutaneous thickening is removed, the connective tissue is divided and the cul de sac of the rectum is exposed. It is secured with a ligature, drawn to the margin of the perineum and sutured to the skin with six catgut stitches. Then the rectal diverticulum is exercised and the meconium allowed to escape. Enemas of glycerine are prescribed and a suppository of vaseline gauze introduced in the rectum to dilate the anus. Cicatrization was rapid and without complications.—(*Rev. Gene. de Medec. Veter.*)

THE Epsilon Chapter (University of Pennsylvania) of the Alpha Psi fraternity celebrated the third anniversary of the installation of the chapter at Essington, Pa., Saturday afternoon, May 13, 1911. The program included a base-ball game between the graduate and undergraduate members, a boat-ride on the Delaware River, in Dr. Glass' naphtha launch, and a planked shad dinner at the Rosedale Inn. Among the honorary members present were: Drs. Alexander Glass, C. J. Marshall, Louis A. Klein, W. Horace Hoskins and K. F. Meyer. Among the invited guests were Dr. Lee H. P. Maynard, of the Alpha Chapter, and Dr. Victor G. Kimball of the Beta Chapter.

ARMY VETERINARY DEPARTMENT.

DRAFT OF THE NEW ARMY VETERINARY BILL.

Below is given the draft of the new Army Veterinary Bill, which found its birth at the Division Maneuver Camp at San Antonio, Texas. It has been subjected to a most thorough discussion at several meetings held by the six veterinarians present at the camp (Drs. LeMay, Schwarzkopf, Glasson, Gage, Gould, Mitchell) and stood the test of scrutiny by military and judicial officers also present at the camp. An advance copy was forwarded to Fort Riley, Kansas, for concurrence in by the five veterinarians at that Post (Drs. Plummer, Jewell, Fraser, Donovan, Mason), who agreed to it with some minor changes suggested by voting section for section.

The bill is now being circulated among the other army veterinarians present in the states to secure unanimous consent. As soon as this is reached, the bill will be introduced directly into Congress. A brief, showing the organization of the British, German and French army veterinary corps and that of our own army under existing law is under preparation and will be forwarded together with this bill.

By military-judicial advice, rank, pay and allowances was substituted for "grade." No clause favoring the older veterinarians by exemption from examination was incorporated, to avoid opposition from the younger veterinarians. The consolidation of the veterinary service was strongly advised.

O. S.

A BILL

"To consolidate the Veterinary service, United States Army, and to increase its efficiency."

Be it enacted, etc., that the President is hereby authorized by and with the advice and consent of the Senate, to appoint veterinarians and assistant veterinarians in the army, not to exceed two for each regiment of cavalry and field artillery, three for the remount depots, one as puchasing officer of veterinary supplies, five as meat inspectors, three as veterinary examiners and in-

structors, and one to act as chief veterinarian, not to exceed fifty-five (55) in all.

Sec. 2. That a candidate for appointment as assistant veterinarian must be a citizen of the United States, between the ages of twenty-one and twenty-seven years, a graduate of a recognized veterinary college or university, and that he shall not be appointed until he shall have passed a satisfactory examination as to character, physical condition, general education and professional qualifications.

Sec. 3. That an assistant veterinarian appointed under Sec. 2 of this act shall have the rank, pay and allowances of second lieutenant, mounted; that after three years of service an assistant veterinarian shall be promoted to veterinarian with the rank, pay and allowances of first lieutenant, mounted, provided he passes a satisfactory examination under such rules as the president may prescribe as to professional qualifications and adaptability for the mounted service; or if found deficient he shall be discharged from the army with six months pay and have no further claim on the government; that after fifteen years of service a veterinarian shall be promoted to the rank, pay and allowances of captain, mounted, after having passed such physical and professional examination as the President may prescribe; and that from the eligible veterinarians with the rank of captain one shall be selected to act as chief veterinarian for the period of four years, and while so serving, he shall have the rank, pay and allowances of major.

Sec. 4. That the veterinarians now in the regular army, who at the date of the approval of this act, shall have had three years service, be examined for the rank of first lieutenant; and that the veterinarians who at the approval of this act shall have fifteen years service, shall be examined for the rank of captain, and that those who satisfactorily pass the examinations be appointed and commissioned to the respective higher ranks according to seniority of length of service, as provided for in Section 3 of this act; and that they shall be entitled to credit for all honorable and faithful prior service in the army as veterinarians or veterinary surgeons in determining their status; or if found deficient for promotion they shall remain in the status of assistant veterinarians until such time as they pass the prescribed examination.

Sec. 5. That the Secretary of War, upon the recommendation of the chief veterinarian, may appoint such number of re-

serve veterinarians as may be necessary to attend public animals pertaining to the quartermasters or other departments and corps, who shall have the pay and allowances of second lieutenant, mounted, provided that such reserve veterinarians be graduates of a recognized veterinary college or university, and have previously passed such moral, professional and physical examination as may be deemed necessary by the Secretary of War for the proper performance of their duties in mounted field service.

Sec. 6. That all laws or parts of laws in conflict with the provisions of this act be, and are hereby repealed.

Army Veterinary Personals.

Dr. Robert W. McKibbin, 4th Cavalry, has resigned from the army service. He was appointed to the army on July 2, 1903. Inasmuch as he was generally regarded as one of our ablest younger veterinarians, sincere regret is felt by all others particularly as his resignation came as a surprise. We have no intimation of the future plans of the doctor, but wish him happiness and prosperity in civil life.

The six veterinarians assembled in the Division Maneuver Camp, signed and forwarded letters to Representatives Hay and Slayden at Washington, expressing their sincere thanks for the assistance these gentlemen rendered in the passage of amendment 26 to the Army Appropriation Bill, allowing retirement to army veterinarians.

Attention is invited to the publication of the Bureau of Animal Industry: "The Diagnosis of Glanders by Compliment Fixation," by Drs. Mohler and Eichhorn. This is a most important report for army veterinarians and is written so concise and lucid as to be of the highest practical value and most interesting reading.

A NEW PLAN FOR THE PROCUREMENT OF REMOUNTS.

Under date of April 19, 1911, appeared from the Government press a pamphlet setting forth a new plan for the procurement of remounts for the United States Army.* Though horses certainly are commanding high prices, there is evidently a short-

* United States Department of Agriculture, Bureau of Animal Industry Circular 178, "Breeding Horses for the United States Army," 13 pp. Part of the Report of the Bureau of Animal Industry for 1910.

age in the production of them; at least those of a sort suitable for army use. For a number of years it has been nearly impossible to supply the army with satisfactory remounts in sufficient quantities, even though, for about ten years, the army has been on a peace footing. The exigencies of the case have been of a nature to force forward the question—how to meet the growing but unfulfilled need for suitable remounts; still more, how preparation shall be made to provide for the supply of army horses for the troops in time of war. It is the duty of the army in peace to prepare for war. If the supply is difficult in time of peace, in war time the difficulty would be enormously aggravated and intensified.

During the past year, says the government document, the Secretary of War requested the co-operation of the Secretary of Agriculture in evolving some plan for enabling the army to obtain suitable remounts. The Secretary of War pointed out that the supply of horses for remounts is getting more and more limited; that the country can hardly supply the army in time of peace with remounts, and that the conditions are rapidly reaching a point when it will be impossible to supply the annual need of the army at the present peace strength; that the army cannot possibly be mounted in time of war from the supply to be had as things are now.

The result of this statement of the Secretary of War to the Secretary of Agriculture was the designation by each of a representative to study the problem and form a plan for its solution. Chief Rommel, of the Animal Husbandry Division of the Bureau of Animal Industry, was made the representative of the Department of Agriculture, and Captain Caspar H. Conrad, Jr., Third Cavalry, United States Army, that of the War Department, detailed for duty in the Quartermaster's Department in connection with the purchase of remounts. Capt. Conrad prepared a statement setting forth the reasons why it is imperative for the government to undertake the task of encouraging the breeding of horses for the army. Chief Rommel prepared the plan for breeding the horse with the assistance of Capt. Conrad and other army officers in Washington. The publication of these reports is approved by the War Department and the Department of Agriculture.

From the pamphlet, in which these reports are printed, I have made excerpts for republication in the "Army Veterinary Department" of the REVIEW, believing that they will be of

uncommon interest to all army veterinarians. Besides, the material is of general interest to a profession which must take cognizance of any plan for the improvement of the breeding of high class horses for army use; or, for that matter, should be interested in the upbuild of breeds of saddlers.

THE NECESSITY FOR GOVERNMENT ENCOURAGEMENT OF BREEDING ARMY HORSES.

"The difficulty experienced by the Quartermaster's Department in procuring remounts seems perfectly natural. The early settlement of the United States, particularly the eastern part, went on some time before the advent of steam and electric transportation, and the settlement of the western part even now in the most remote points takes place without the assistance of modern transportation. In all new countries the horse has played an important part in the advancement of civilization and the general scheme of settlement. Even in the first part of the nineteenth century the horse was a very much more important animal in Europe and the British Isles than at present.

"During the opening of a country the settler must, owing to the absence of roads and other forms of transportation, put his principal reliance upon the horse; he is forced to travel trails and long distances, and for this purpose finds that he needs a horse suitable to carry him quickly and comfortably to his destination. To accompany him and carry the articles necessary for his daily life, he needs a pack animal. So long as conditions remain unchanged, a desirable type of saddle and pack animal will exist in good numbers; but so soon as the country becomes more permanent, the mountain trail gives place to the country road to the worked and settled highway, and the type of horses rapidly changes. The necessity for the saddle animal lessens; the light-draft animal becomes more important; the people ride less and discard the expensive pack transportation; the horse is attached to a light vehicle with which he is able to transport more than one person or a heavier load.

"As the roads become better and the country more extensively cultivated, the lighter horse is used more for pleasure or solely as a means of drawing the carriage; another type of horse becomes more useful and economical, and the light-draft type appears to be succeeded by the heavy draft. Next come the railroad, the trolley line, and the automobile. The people ride

and drive less, and fewer horses of the riding types are bred. Riding is indulged in almost solely for pleasure. A new country is a country on horseback; an up-to-date one, a country in an easy chair.

"In the United States the type of horse suitable for army purposes is now proportionately less numerous because it is not found necessary to the civilians of the country, and the Quartermaster's Department is finding it each year more difficult to supply the yearly demands of the mounted branch of a small army.

"The horses of our mounted branches are severely criticised by representatives of foreign armies, while from our own officers come reports of poor animals, poor performance, many quickly developed unsoundness, and short life.

"As an illustration—in the West it is found that a marked change has taken place in recent years in the so-called 'cow-pony.' Twenty years ago cattle ranches of the West were practically without fences and unlimited, and the cow man found it necessary to breed and use a type of quick, active pony. As the West became settled and as agriculture was taken up the large free ranges changed to the large fenced pastures of a few years ago. These large pastures are now being broken up into even smaller ones. The yearly round-up requiring riding over immense distances and active work has about disappeared. To-day cattle are not chased and roped, but are driven into the small pastures and pens and quietly handled. The quick cow-pony of the past has given place to a larger animal, frequently having a cross of draft blood. It may be said that the cow-pony of the West has practically disappeared.

"Virginia has long been famous for the horse known as the Virginia hunter. Even the breeding of this type of horse has been sadly affected by the high price of heavy draft horses, and further influenced by the fact that only those hunter-bred horses that attained full size brought high prices. Under the haphazard methods of breeding in vogue in these sections not more than 1 in 6 colts could be depended upon to attain the size necessary to bring a high price, and the farmer found himself the possessor of four or five small horses for which there was no steady market. When he found that all draft colts, in spite of minor blemishes, brought good prices as 3-year-olds, he at once ceased to breed the hunter type, with its many misfits, and commenced on heavy draft horses. The disappointment in the hunter bred

horse would not have been so great had the breeding of this type been done scientifically and rationally. The hunter bred horse as now raised in Virginia is sired almost entirely by stallions either sent to the country gratis or sold at small prices to individuals by wealthy people in the North who desire hunters and are looking to the future supply. A farmer living in the neighborhood of a thoroughbred stallion, and feeling that he would like to breed a hunter, will take advantage of the nearest and cheapest stallion in his neighborhood, regardless of what the result may be. All that he considers necessary is that the horse should be, first, a thoroughbred; and, second, that he should be a pleasing individual; never taking into consideration the fact that the mare might not be suited to the horse nor the horse to the mare. Hence the misfits, the discouragement, and the decrease in number of the hunter type. It is said that not one-tenth as many hunters are bred in Virginia to-day as formerly.

"Even more appalling than the present scarcity of horses suitable for military purposes in this country is the large number of unsound horses that are constantly being examined by purchasing officers. Horses of this class can be the result of but one thing, and that is an absolutely irrational system of breeding, or the lack of any system whatsoever. When it is remembered that a sound and serviceable horse of a particular type costs no more to raise than an unsound horse, the immense waste caused by our present lack of system is only made more apparent.

"The enactment in a number of states of laws whose effect is to prohibit the standing of unsound stallions for public service will, no doubt, in time, tend to correct the evil; but not until the horse-raising states generally prohibit absolutely the public stud service of unsound stallions will unsound horses be less common on the market. Such legislation in one state is an excellent thing for that particular state, but it is very likely to drive all the unsound stallions across the borders into adjoining states where laws against the unsound stallion does not exist.

"The next census will probably show that there are in the neighborhood of 23,000,000 horses in the United States. It would seem that in this immense number there must be many thousands of horses suitable as remounts for the army, and there probably are; but the fact that the type desired is comparatively scarce, and that the horses that would do are scattered over an immense area and are in demand for other purposes than the

military, makes it not only expensive and impracticable to obtain them, but next to impossible to do so.

"The purchase of young horses for the army during the last fiscal year has been more or less successful, but all officers connected with the Quartermaster's Department have reported that while they were obtaining a fair number of horses, they could see no prospect of obtaining them in any number in future years, and all report the apparent necessity for the Government's assistance in the rational breeding of army horses in the country.

"As no system of supply, so far as the army is concerned, which deals with peace conditions alone, is complete, the War Department must constantly keep in mind the possibilities of war, and it is not surprising that finding difficulty in purchasing a supply of remounts for the peace army, there should be more or less uneasiness when war requirements are considered.

"The waste of horseflesh in war times is enormous, and in a war of any magnitude in which this country might be engaged the number of horses required will not be confined to the thousands per year, but will extend into the hundreds of thousands."

Here follows figures taken from the records of the Quartermaster's Department, United States Army, during the Civil War, showing the enormous increase of purchases of horses as the war proceeded, and the great loss in horseflesh occasioned by shot and disease.

"Until recently acts of Congress appropriating money for the purchase of horses for the army required that they should be purchased by contract from the lowest responsible bidder after advertisement. The specifications of the horse to be delivered under contract are those of a perfect animal, which, of course, is seldom seen. The inspectors and purchasing officers are required to reconcile these specifications with existing conditions, keeping in mind fairness both to the contractor and to the government. This system led to the building up of the class of middlemen who purchased animals from the breeders, presented them for the action of the government inspectors, and sold them at the contract price. Until recently this price ranged from $100 to $150. Considering the large expense to which the contractor would be put, it could not be expected that all of the government's money would be invested in horseflesh. The result was, considering the profit by the contractor, his expense, etc., that the price paid by the government secured for the cavalry a horse worth from $70 to $100. Nothing is known of

the breeding of these animals further than that they were 'probably of such and such breeding.' Often the question of breeding was not raised, the principal requisite being that they should give promise of performing the duties expected of them. The contract system has tended to discourage the horse breeder of the country, as the money paid him by the contractor, after much haggling, was often very little more than the cost of raising the horse. There has been no incentive for breeders, even in the best naturally endowed sections, to breed the type of horse that the army needs.

"Again, in recent years the demands for heavy draft animals for farming purposes, the high prices that these animals are bringing, the fact that they cost no more to raise, and bring even a higher price although blemished, has had a further bad effect upon the breeding of the desired saddle type. Even before the present high prices of all horses and the higher price of the draft horse existed, the breeding of the type considered best for army purposes received another severe set back by the adoption of electric and cable street railways and the best extension of the trolleys. While not generally appreciated, the best 'railroaders,' as the horses used for street cars were called in the market, were the very kind that made the best cavalry mount. This horse was desirable for street-car purposes because of his endurance and his willingness to work.

"The contract system received its first serious setback, from the contractor's standpoint, when the army, due to the clamor for better mounts, insisted upon a closer compliance with the contract specifications and rejected more of the horses presented by the contractor. The sudden rise in the price of horses further embarrassed the contractor, and the added difficulty of obtaining horses to present for inspection, caused many of the contractors to fail in their deliveries, made others reluctant to bid, later led to the impossibility of obtaining horses under this system in certain sections, and finally led to authority being given by Congress for open-market purchases. This method, while apparently a little more expensive to the government, had the advantage of eliminating the middleman, giving the breeder all the money which the government was willing to pay for horses, and giving the government value received in horseflesh.

"The establishment in 1908 of the remount depots has further improved the type of horse for the army, as the system of purchasing young horses 3 and 4 years old, often unbroken, has

enabled the government to get the best type of horse before he has cost the breeder much money and when he could be sold for a reasonable amount. These horses sent to the depots for maturing and handling, and finally issued to troops as 4½ and five-year-olds, while costing the government more per head than the horses 5 and 6 years old formerly purchased and issued directly to troops, are very much better horses from the beginning, are properly developed at a critical period in their existence, rationally handled, and, when issued to troops, have been received with enthusiasm as a great improvement over the matured horses formerly issued under the old system. Even considering the high market value of horses at present, it is believed that, under the remount system, horses can be issued to troops at not to exceed a total average cost of $225. The latest contract price of cavalry horses is $183.75; for artillery horses, $213.75. Many of the late contract horses are young and require some handling at depots before suitable for service; others are mature.

"Horses purchased as mature under the old system have had a useful life in the army of 6.4 years on an average. The better grade of horses, such as are now being purchased, rationally developed and handled, should and will have a useful average life of 10 years. It is easy to see that the better horse issued from the depot at a cost of $225, that last 10 years, is cheaper than the horse costing from $183 to $213, lasting only 6.4 years. In addition, the army will have had a better horse throughout the entire period of usefulness. The horses being issued from the depot could undoubtedly be sold at time of issue at a handsome profit. Many individuals would bring fancy prices. It is needless to say that if it were possible to purchase them in issue form, it would be necessary to pay much more than they have cost under the depot system.

"European countries long ago found it not only advisable but necessary to supervise the breeding of horses in order to supply the demands of their armies, and every European country of importance, with the exception of England, has for years been encouraging the breeding of the proper type of army remount. England, one of the most important horse countries of the world, has for many reasons only recently been forced to this step. It is interesting to note that practically the same conditions confront England that confront this country at the present time, and that almost identical steps are contemplated in the two Anglo-

Saxon countries to accomplish the same result—suitable army horses in sufficient number."

Then appears the plan for the breeding of horses for the United States Army—the purchase of stallions by the government; their distribution in breeding sections of the country, and the get expected from them. The plan, indeed, is similar to that adopted for the encouragement of the breeding of suitable remounts for armies on the European continent.

"Those localities should be selected for breeding districts where conditions are especially suited to horse raising, where the type of mares is most likely to approach the type of horses desired for the army, where a light type of horse will always in the long run be the most profitable to the farmer and draft horses least likely to gain a firm foothold, and where mares are sufficiently numerous to give the stallions maximum service. A careful survey of the horse-raising districts of the country will be necessary before this question is settled, and the returns of the Thirteenth Census can probably be used. The Bureau of Statistics of the Department of Agriculture states that it is impossible to use its returns for this purpose. Perhaps, however, that bureau could assist in making the survey.

"The government reservations where stallions would be kept between the breeding seasons would be the points around which the work would centre. In some cases it might be possible to stand some stallions at the central station itself. Stallions should be distributed in lots of five around the central stations, and such further distribution could be made as necessity required. At the close of the season they would be returned to the central station and kept there until the next season or sent to another locality.

The Experimental Feature.

"The plan has experimental possibilities of the highest order, which should be utilized. The leading features are the test of the value of different breeds to produce remounts and the value of different soils and climates for the purpose, which could soon be determined by the army by keeping records of performance. Certain troops, squadrons and batteries, and entire regiments, could be supplied with remounts bred in a certain way in certain localities, and the possibilites of the plan from an experimental

standpoint would thus become very great. By the time a second large appropriation to purchase stallions would, if ever, be necessary, the government would be in possession of facts which would enable it to show definitely whether the plan had been successful, and whether any crosses or localities should be eliminated from further consideration. It might be well, also, to consider the feasibility of arranging with the breeders to reserve a small number of high-class fillies each year for breeding purposes; otherwise mare owners would be compelled to replace their mares by purchase, which would bring the problem little nearer solution at the end of 20 or 50 years than it was at the beginning. That it is possible in time to fix the type desired for remounts is by no means questionable, and this may indeed be very desirable.

Terms of Service.

"No mare should be bred to a government stallion until she has been approved by the proper officers as of the type suitable to produce remounts. The common unsoundnesses, the tendency to which may be transmitted from one generation to another, should naturally disqualify a mare, but even more important would be the necessity to refuse a mare on account of manifest faults of conformation, action or quality.

"The terms of service should be free, the owner of the mare entering into a contract to give the War Department an option on the resulting foal during the year it is 3 years old (estimating a horse to be 1 year old on the 1st of January after it is foaled) at a price to be fixed before the mare is bred. A provision should be included in the contract that the mare must remain in the owner's possession until the foal is weaned, and that, in case the foal is sold before the War Department has exercised its option, a service fee shall be exacted from the breeder of the foal. Provision should be made, however, to cover such emergencies as the death of the breeder, etc.

"The price contracted to be paid for remounts should be fixed annually for each state by a board of arbitration before the breeding season opens, subject to the approval of the Secretary of War. For example, in January or February, 1912, this board would meet in each state mentioned above and agree upon the price to be paid for remounts bred in that state to be purchased in 1916; in 1913 prices to be paid in 1917 would be fixed, and so on. The arbitration board should be composed

of an officer of the army, an officer of the Department of Agriculture, and a citizen residing in the state, preferably a competent horseman. In purchasing remounts, no discrimination should be made against mares; colts should have been castrated at the breeder's expense, preferably between 1 and 2 years of age.

Organization.

"The breeding work would be administered by the Bureau of Animal Industry of the Department of Agriculture through the Chief of the Animal Husbandry Division. This division would direct the work under the supervision of the Chief of the Bureau, and keep the breeding records and the reports on the development of foals.

"Not later than January 1 of each year it should furnish a report for transmission to the War Department on the actual number of 3-year-olds in each breeding district available for purchase during the year and the probable number of these that will make satisfactory remounts. A competent animal husbandman should be employed, with headquarters at Washington, as a traveling inspector of breeding stations, to keep the department in close touch with the work in addition to receiving regular reports from the breeding districts. *The man in charge of the breeding districts should be obtained from the field force of the Bureau of Animal Industry. These men should be good veterinarians, with a thorough knowledge of horse husbandry. Their field experience would make them invaluable for this work, and the loss to the field service of the bureau would be more than compensated by the fact that they could handle the work better than any men who might be obtained from the outside. If the government undertakes this project it must do so under the most favorable auspices, and no risk of failure should be run. As success would largely depend on the ability of the men in charge in the field, the best men available should be obtained.* The expert assistants to men in charge of breeding districts should be animal husbandry graduates of agricultural colleges, and not veterinarians. This would balance the service in a very effective way.

"The duties of these men would be to direct the work at the breeding stations in their districts, to attend to the keeping of the records, to advise mare owners on the care of the horses, and, if possible, to travel through their districts before the breeding

season opens and approve mares, directing how they should be bred, if necessary. Until the work is on a thorough, well-organized basis, the approval of mares should be done by the men in charge of districts or their expert assistants.

"The men in charge of stallions as stud grooms should be employees of the Department of Agriculture, for whose appointment experience in the handling of horses should be the first consideration.

"Preference should be given men who had been honorably discharged from the mounted service of the army and who presented certificates from officers in whose commands they had served showing their proficiency in horsemanship.

"It is hardly necessary to point out the desirability of having the breeding service so organized that it will be carried on from year to year by the same or about the same corps of employees, in order that it may have a definite, stable, and continuous policy."

What do the cavalry and artillery veterinarians think of this plan for the amelioration of the difficulties of procuring suitable remounts? The articles in the public documents, as a rule, are very chary in their praise of the work of the veterinarian, and writers are loath to accord him his mead of recognition for the work he is capable of doing for the improvement of the mounted service of the army. Seldom is his work appreciated; more seldom is he mentioned in complimentary terms. Yet in this circular on "Breeding Horses for the United States Army," written by Captain Conrad in collaboration with Chief Rommel. we find compliments paid to the ability of at least the veterinary field force of the Bureau of Animal Industry. "Their field experience (that of the bureau field veterinarians) would make them invaluable for this work and the loss to the field service of the bureau would be more than compensated by the fact that they would handle the work better than any men who might be obtained from the outside." I have often thought that the high officials of the army appreciate the veterinary force of the Bureau of Animal Industry and place greater confidence in its dictates than they do in the suggestions of their own veterinarians. When the bureau is asked for information by the army, or is asked to do a piece of work for the army, it is given or done in a fashion which forces the reposing of confidence. Reports are made, or letters written, without that excessive regard for overnicety of official language and excessive care not to touch to the quick the feelings of superiors in office or grade which is cus-

tomary, and apparently necessary, in other official circles. Whatever be the reasons for it, the findings, as in this plan for the breeding of horses for the United States Army, are accepted as from those having authority to speak. Should the reform proposed be carried out and be successful government veterinarians, at any rate, would rightfully receive the laurels. The army horse would be a better horse. He would be even more esteemed in the mounted service than he is now. Whatever improves the horse in the mounted service improves the veterinarian. The fortunes of both are bound together indissolvably.

D. ARTHUR HUGHES.

OBITUARY.

Dr. Donald C. Sutherland, died at his home in Saginaw, Mich., March 29th, as a result of a runaway accident. He was a charter member of the Michigan State Veterinary Medical Association, and the oldest graduate in point of years in the state. The state association was represented at his funeral, Drs. Brenton, Cumming, Joy, Donald, Hisey, Cronkits and Carter acting as honorary pall bearers. Dr. Sutherland was one of the most faithful members of the association, always on the side of progress, and will be deeply missed by his fellow members. He was a public-spirited man, and always contributed his quota to public enterprises. He is survived by a widow and three sons; also two brothers and three sisters.

DR. GEORGE B. GILMOR, graduate of the American Veterinary College, died at his home in Oakland, Pa., May 1. The doctor was born in Titusville, Pa., 38 years ago, and had been practicing veterinary medicine in the Oakland district for the past 13 years. One son and two sisters survive him.

DR. JAMES MARION SLOAN, graduate of Ontario Veterinary College, died at his home, Jamestown, Pa., of heart failure, on April 12th last. Dr. Sloan was born in Sandwich, Ill., in 1857, and had practiced his profession in Jamestown, Pa., since 1889, in which place he had become a prominent and honored citizen. He is survived by a widow, two daughters, three brothers and three sisters.

BIBLIOGRAPHY.

VETERINARY ANATOMY.

VETERINARY ANATOMY. By Septimus Sisson, S.B., V.S., Professor of Comparative Anatomy, Ohio State University, College of Veterinary Medicine. Octavo of 826 pages, 528 illustrations. Philadelphia and London; W. B. Saunders Company, 1910. Cloth, $7.00 net; Half Morocco, $8.50 net.

This most excellent American production deserves the hearty support of the entire veterinary profession; not only of America, but of the world. It has been an accepted truth for a decade, that illustration is the best and surest method of instruction. This fact has undoubtedly been very strongly appreciated by Prof. Sisson, as in his work on anatomy, the relative amount of space devoted to illustrations, is much greater than in other similar works. And, which is of still greater importance, the illustrations are of a superior type; both in the workmanship incident to their production and their relation to the study of the subject in question.

No one, no matter how casually he may glance through *Sisson's Veterinary Anatomy,* can fail to note the clearness and correctness of the illustrations, rendered more striking, more instructive and more useful by the use of colors in many of the figures. Added to the superior illustrative feature of his work, the author has, while treating rather fully the important points, strongly condensed the general text; which makes it possible for the student to gain a great amount of anatomical instruction with a comparatively small amount of reading. The same feature materially increases its value to the practitioner, who desires to refresh his memory on regional anatomy at times, often with a limited amount of time in which to do it. Besides, brevity on any subject makes it doubly interesting, provided the ground is fully covered. The paper is clean and the type clear and easy to read.

In brief, the *special* and *new* features which render the work of this earnest, original and painstaking American author of

exceptional value, are the extensive use of photographs of material, and the first description of the true forms of many of the viscera as determined by in situ fixation (the material being entirely new), the changes in nomenclature, which are designed to reduce the enormous labor imposed on students by having a large number of synonyms, and to produce some conformity with the modern terminology of comparative anatomy; and, finally, the introduction of numerous topographic illustrations with a view of bringing the subject into close relation with the clinical branches, so that the book may be advantageously used, as already stated, by advanced students, and by practitioners for ready reference. The author deserves more than ordinary encouragement at the hands of the American veterinary profession in producing an American text book on so important a subject as veterinary anatomy; the fundamental subject in veterinary science; as, aside from the *individual* benefit derived by students and veterinarians in the *possession* of the work, it may be rightfully considered as a national benefactor in placing the American veterinary profession on a firmer basis and in a more assured position. Already this work has been adopted as a text book in the veterinary schools and departments at Cornell University, University of Pennsylvania, Ohio State University, George Washington University, Washington State, Iowa State, Kansas State, University of the Philippines (Manila), University of Melbourne (Australia), Kansas City Veterinary College, and many other veterinary schools, the names of which have not reached us. So that even at this time, early in the first edition, it has become an international text-boook on veterinary anatomy.

FOODS AND BOOKS.

A Review of Some Recent Publications.

By D. Arthur Hughes, Litt. M., Ph.D., D.V.M., Inspector of Food Supplies, in Charge of Office Subsistence Dept., U. S. Army, Chicago, Ills.

There are two journals, each a weekly, which enjoy equal place in public esteem because of the reliability of the information which they furnish, and the sway which each has over the minds of men, though in widely different fields of thought.

Both of them are published in the city of New York, and, from that metropolis, furnish electric currents of influence felt the country over. The one is *The Nation,* the other is *Science. The Nation* exerts a tremendous influence, through the articles regularly appearing in its columns from every eminent specialist and through its book reviews by the same class of men, upon historical, literary, political, economic and philosophical thought. *Science* has the same general scheme of editorship as *The Nation;* but its columns are regularly filled with editorials, general articles, reviews and notes covering the wide range of pure and applied science, especially the natural sciences—physics, chemistry, geology, botany, horticulture, agriculture and the like.

When, therefore, *Science* speaks, it is not in a hollow voice. When a book review appears in *Science,* it is written by a specialist. We may not hearken to its statements, but at least they can be taken with confidence. Shortly after the appearance, several years ago, of Dr. Harvey W. Wiley's great work, "Foods and Their Adulteration," and after it was favorably noticed in the columns of THE AMERICAN VETERINARY REVIEW, an article appeared in *Science* closely corroborating the judgment of the book given in these columns. The reviewer in *Science* said: "Seldom has a more timely book appeared than this, following so closely, as it does, the beginning of the enforcement of the national pure food law. For some time prior to the passage of this law public interest throughout the country had become vitally awakened to the importance of the pure food issue. Amid a large mass of confusing and often exaggerated newspaper articles upon the subject it is a comfort to find a book covering the filed so completely, so sanely, and withal written in so interesting a manner."

The second edition of this masterly work has just appeared from the press. Its title is "Foods and Their Adulteration, Origin, Manufacture and Composition of Food Products, Infants and Invalids Foods, Detection of Common Adulterations and Food Standards." The author is Harvey W. Wiley, M.D., Ph.D., Chief of the Bureau of Chemistry, U. S. Department of Agriculture.* There cannot be any question that Dr.

* Foods and Their Adulteration; Origin, Manufacture and Composition of Food Products, Infants and Invalids Foods, Detection of Common Adulterations and Food Standards, by Harvey W. Wiley, M.D., Ph.D., with eleven colored plates and eighty-seven other illustrations. Second edition; revised and enlarged; cloth; 641 pp., octavo; with chapter synopsis and index. P. Blakiston's Son & Co., Philadelphia (1012 Walnut street); $4.00.

Wiley is the greatest living American food specialist. His name is a synonym for accuracy in the chemical analyses of foods. The second edition of his "Foods and Their Adulteration" is produced at the zenith of his power and influence, and the reliability of its statements needs no argument; for, not only is Dr. Wiley the Chief of a bureau which he has organized into a system of laboratories, many of them specializing in the chemical analyses of different kinds of foods, and filled with food experts of which he is director; not only has he been, for many years, secretary of the American Association of Agricultural Chemists, through which his directing mind has brought about a national system of co-operation in food analyses, between state, corporation and private laboratories and the national laboratories, whereby national food standards have been formed and published; but he has had access to all recent literature on foods, and his book is really a digest of these stores of knowledge.

To the veterinarian who is an expert, or who hopes to become an expert, on animal foods and animal food products, Wiley's book should prove infatuating. And to the large and growing number of these we direct attention to the work. The first chapter, of 116 pages, is on meats and meat food products, in which he takes up many quetions relating to the preparation, inspection and preservation of foods of animal origin. In the second chapter he takes up poultry, eggs and game birds. The time is coming when American veterinary food experts, like those of Continental Europe, will have to know more on these topics. The same may be said of chapter three, of 50 pages, on fish foods. The next chapter is on milk, milk products and oleomargarine—surely of interest to veterinarians. In fact there are about four hundred pages in the volume closely related to the work of the veterinary inspector of food supplies, or to the veterinary sanitary supervisor of the manufacture of human foods of animal origin.

We wish we could speak in the same terms as we have done of Dr. Wiley's book of a book on meat canning which has recently appeared, namely, "The Modern Practice of Canning Meats," by G. T. Hamel; pp. 93; heavy paper, cloth; illustrated with 15 electrotypes of machinery; the Brecht Co., St. Louis. This thin book, of only ninety-three large type pages, selling for so large a sum as five dollars, is divided into eight short chapters. They are—Chapter I. Preservation of food products in air-tight receptacles. Chapter II. The vacuum theory, Exhausting or

Venting. Chapter III. Canned meats containers. Tin cans, glass jars. Chapter IV. Application of the theory to meat canning. Chapter V. Receipes and formulas. Chapter VI. By-products of the beef department, bones, extract of beef. Chapter VII. Miscellaneous, auto-vacuum, centrifugal dryer, canning of raw meat. Chapter VIII. Inspection and legislation.

We do not wish to be unfair to the author of this work, but, perhaps because of our exceeding familiarity with the facts which it brings out, we confess to being disappointed with its contents. The book, in reality, is only a primer, not a manual covering exhaustively the gigantic canning industry of the United States and other countries. Those who are not familiar with the facts which the book brings out—the primary facts in modern canning practice—can learn much from its pages as it speaks in unadorned, and, at times, hackneyed English of canning practices.

We understand the author is reputed to be an authority on meat canning. But at times he blunders into the worst of errors. "But of the rounds (of beef)" he says, "three pieces (of dried beef) are made in the standard cuts, the names of which are 'inside,' 'outside' and 'knuckle.' The knuckle is the best piece, owing to its shape; then comes the outside, then the inside." Every canning man in Chicago, who reads this, will guffaw. In the trade all agree that the "inside" is the best piece; next the "knuckle," last the "outside." As a matter of fact, the "inside" is more bulky and more tender. The "outside" is toughest for the reason of the great amount of work thrown on the adductor muscles of the thigh in locomotion of the animal. The writer of this review has seen, for years, at close range at the "rocker" the making of millions of pounds of corned beef hash in the great Chicago houses, such as Libby, McNeill and Libby's, Armour's, and Morris's, but has never seen "eggs" used in any formula, though Hamel says that eggs are used in the making of corned beef hash. Eggs would undoubtedly make a good addition for a corned beef hash formula; but the change would only be suitable for a recipe for Mrs. Rorer's Cook Book, where the culinary art is bared for use in domestic kitchens. Hamel's tables are at least questionable. For instance, it is not the custom to "process" ox tongues by "open vent for two hours," as he says, because the jelly would run out of the cans. We are told by the author that potted meats containing "small pieces, trimmings, etc.," have the "same nutritive value as other cuts." We wonder what Dr. Harvey

W. Wiley would say to this? Does not Hamel know that the Bureau of Chemistry of the United States, Department of Agriculture, has made analyses of the nutritive value of meat products and has tabulated the results in public documents? The author goes on to say this with regard to potted meats, which every canning man knows consist of comminuted odds and ends of every description. "Before the enactment of the recent pure food laws now in force in all civilized countries a few packers had given a bad reputation to this class of canned meats by using inferior materials in their preparation, but that time has passed and the consumer of government-inspected foods *knows that he is buying what is described on the label.*" Pshaw, if it were possible to describe on the label all that was in potted meats the meagre surface of the label could not contain it all. Hamel must know that the potted meat can offers a means to grind up scraps and oddments of every variety of cured and uncured meats, mix them with spices and sell them at a small sum for each small package. Potted meats are clean and wholesome; but the contents of a potted meat can are not "described on the label."

Dr. C. B. Frederick, of Canton, Ohio, writes: "Find $3 interest on the veterinarian's grandest asset. P. S.—Have not received my April Review. Please send it—as I do not want to miss one number."

Dr. A. O. Kennedy, Columbus, Tenn., writes: "The Review always comes as a welcome visitor to my table. I must congratulate you on the success you have made in making the Review the best journal published; it is a boon to the profession."

Dr. W. A. Walcott, Pymouth, Wis., writes: "Find inclosed check in payment for the Review for the coming year. Our office force looks forward to its arrival each month, and would be somewhat disappointed if it failed to appear. I have ten bound volumes and value them the highest of anything in my library."

CORRESPONDENCE.

NOTICE TO RESIDENT STATE SECRETARIES.

FORT COLLINS, COLO., May 3, 1911.

MY DEAR DOCTORS:

You were selected in each instance, for Resident State Secretary, because you had the reputation for *doing things.* How many applications have you secured for membership? Please do not put this matter off longer, as applications should be in the hands of Secretary Marshall by the middle of July.

Of course you are getting your data together for report on things veterinary in your state.

Everything now points to the fact that the Toronto meeting will probably eclipse, in every way, all previous meetings of the A. V. M. A. Arrangements already perfected warrant me in making this statement. You may safely promise that the A. V. M. A. programme will be of unusual interest, that the meeting of Faculties and Examining Boards will have up for discussion and recommendation some things of vital importance to the profession, that the entertainment committee are going to show us the limit of Canadian hospitality, and you know what that means. The meetings will be held in the beautiful Convocation Hall, Queens Park, Toronto, in connection with the Toronto University.

Urge all eligible veterinarians to make application at once, and to attend the meeting at Toronto, which is held in connection with the pioneer veterinary educational institution in America.

From this time on let us keep busy.

Yours for success,

GEO. H. GLOVER,
President A.V.M.A.

FORT LEAVENWORTH, KANSAS, April 13, 1911.

Editors AMERICAN VETERINARY REVIEW:

I have read with some interest and a little bewilderment, not unmixed with a few grains of amusement the article in the April number of the REVIEW, signed D. Arthur Hughes.

I met the writer at one of the meetings of the A.V.M.A. in recent years and remember him as a cheerful, optimistic gentleman whose knowledge of the military establishment, as I soon discovered, was confined to the subsistence department.

At the time of which I write the Dr. was full of a scheme for the establishment of a veterinary school at Fort Riley. For what? The reinstruction of forty-two veterinarians of the regiments who at the time were engaged in a struggle for the recognition accorded every enlisted man but denied them—that of retirement and some kind of a status. One-third of these men had served 25 years each; one-third had served upwards of twelve years, and the other varied in service from three to eleven years.

After explaining the situation to the Dr. he still remained optimistic, for not knowing or understanding the real situation he could but see as through a glass darkly.

It is right and proper that the young veterinarian just joining should receive some military instruction and I believe that Fort Riley would be the best place for that.

Dr. Hughes has now another scheme for us, who, by the way, are still without a status, and suggests a meat inspection school for veterinarians of the army, not knowing, of course, that many of us have been inspectors in the Bureau of Animal Industry, which is an institution second to none and which deserves all the credit for the advance this country has made in scientific meat inspection.

The optimistic Dr. seems to believe that the veterinarians of the regiments are neglecting their opportunities in not hot-footing it on the trail of meat inspection and the diseases of horned cattle and swine.

The cheerful Dr. forgets, if he really ever knew, that the veterinarians of the regiments and the Quartermaster Department in our army have no more official weight than an inflated toy balloon. That their opinions are seldom asked and that their advice is rarely taken on any subject.

The Commissary General may appreciate the service of the Dr., for he is a wide-awake Commissary General, as we all

know, and is just as sharp as his name. He may send his officers and non-coms to Chicago, or Kansas City, or St. Louis for instruction in regard to beef, bacon and general subsistence supplies, but he could not have one of us detailed for duty in his department without robbing some regiment of its veterinarian.

I would like to say to the Dr. and to your readers that the veterinary service in our army will never be anything but a name until a veterinary corps is established.

An army is composed of privates, non-commissioned officers and officers. The veterinarian of the regiment is none of these, consequently he is a civilian and the voice of a civilian in affairs military is like to the sighing of the wind in the pine tops—air meeting with resistance.

In matters of a military character the civilian, be he ever so brilliant, must of necessity occupy the rearmost seat if one be vacant, otherwise he stands well to the left rear shifting his weight from one foot to the other while his whole mind is occupied in wondering what time it is. Give him rank and he is immediately conducted to a seat—one will be found for him—and he will be listened to with attention. The more rank you give him the better will be his seat and the more attention will be paid to what he may choose to say.

The veterinarians of our regiments have been shifting their weight from foot to foot since time immemorial and about the end of each session of Congress they take a look at the clock just in time to see a hand set it back two or three years.

"Every mickle makes a muckle," quotes the Dr., but there is little prospect for the veterinary profession in our army unless he and our friends get together and do what the dental surgeons did so easily—persuade Congress to establish a corps.

If we ever do get a veterinary corps I sincerely hope that Dr. Hughes will be a member of it and that his optimism and cheerfulness may be the means of, at least, pointing the way to the betterment of the service.

The veterinary profession in the United States is influential enough to call upon Congress to recognize it through the Army, and I believe it should do so unless it is still lacking in pride and spirit. The work of Dr. Turner in securing the passage of the retirement clause was the herculean work of one man, practically unaided. It was accomplished through a spirit of personal pride, but this retirement was but a personal affair after all. What is needed is recognition of our profession and a

recognition that will place it above the plain of the "horse doctor" if I must say it.

GERALD E. GRIFFIN,
Veterinarian Third Field Artillery.

3621 INDIANA AVENUE, CHICAGO, May 16, 1911.

Editors AMERICAN VETERINARY REVIEW,
509 West 152d street, New York.

In furtherance of the movement of Dr. Glover, President of the A. V. M. A., for a uniformity in veterinary degrees the undersigned introduced a resolution at a meeting of the B. A. I. Veterinary Inspectors Association of Chicago, held on the 12th inst., which stated that "this association favors the movement inaugurated by Dr. George H. Glover, President of the A. V. M. A., for a uniformity in veterinary degrees and the delegate to the next meeting of the A. V. M. A. is hereby instructed to convey this action to that meeting."

The motion was passed unanimously and without discussion.

Would it not be a good plan for other associations to so instruct their delegates to the next meeting of the A. V. M. A.?

Personally I like the degree I now have, abbreviated V.M.D., and think there are several arguments in its favor, but am willing to abide by the action of the association.

Very respectfully,

H. D. PAXSON.

AGAIN we call attention to the observation of "Tuberculosis Sunday" by many of the churches of Lawrence, Mass. Dr. Winchester, the leading veterinarian of that place for the past thirty odd years, delivered a very interesting and instructive address on the nature of the disease and the modern methods used to suppress it, at the Y. M. C. A. A year ago the REVIEW published an abstract from Dr. Winchester's address delivered at that time. It is such men as Winchester that elevate the veterinary profession to the level of our sister profession while educating the people of his community on subjects so vital to their health and well being.

SOCIETY MEETINGS.

MEETING OF THE IOWA VETERINARY ASSOCIATION.

The meeting was called to order January 3, 1911, at the Pilgrim Hotel, by President Neiman, who introduced the Mayor, Mr. Ingerlude, who gave an address of welcome, which was responded to by Dr. H. E. Talbott. Minutes as published in the December, 1910, issue of the AMERICAN VETERINARY REVIEW, approved as published. President Neiman read his address. Report of the Secretary was read. Treasurer's report read, and a committee, composed of S. K. Hazlett, J. Potter and N. W. Repp appointed to audit same. They later reported favorably. Report was accepted and committee discharged.

Owing to error in initials, J. A. Bown was excused from dues to date. Dr. G. A. Blanche read his paper, "A Few Don'ts," which was quite thoroughly discussed, particularly that part dealing with anaesthesia.

Dr. L. L. Diller reported a case which brought out varied opinions on the use of bacterins. The discussion also brought out the use of influenza, anti-toxine and nuclein in a large number of cases.

Dr. D. M. Campbell read a paper, "Our Conception of Immunity," which was very freely discussed.

S. A. Deming reported cases of "Septicaemia from Injuries," and a number of cases were reported in the discussion following. "Strangles," "Purpura," "Ulcerated Tongue," "Split Tooth," "Malignant Oedema," "Air under the skin from an injury." Iodine externally and internally, with whiskey was very highly recommended for treatment.

Committee on Sanitation. Report read by Dr. F. H. P. Edwards. This was quite thoroughly discussed. Report was accepted and committee discharged. "Some Professional Blanks" was reported on by Dr. J. I. Gibson. The advisability of a uniform blank for all purposes was urged and that the secretary be authorized to keep same on hand, to be sold at a reasonable profit.

A committee, composed of L. O. Shipley, J. S. Potter, D. E. Baughman, J. I. Gibson, G. W. Blanche, was appointed to report

on such blanks; after some discussion they requested more time before reporting, which was granted, and committee is to remain intact for the year.

Mr. Geo. M. Judisch, Instructor of Pharmacy at Iowa State College, gave a talk on "Alkaloids and Glucosides," also demonstrating a great many chemical changes which take place.

Drs. W. B. Niles, P. O. Koto and R. Graham discussed "Method of Immunization Against Hog Cholera." This subject was discussed very freely by a large number of those present.

Dr. H. B. Tremain read a report of "A Case of Colic with Treatment." Dr. L. H. McLeod "A Few Cases of Colic." Dr. L. U. Shipley, "Some Cases of Stomach Engorgement." Dr. J. E. Vincent "Colic, Indigestion and Impaction." These four cases were discussed together and the subject was thoroughly gone over. The advisability of giving oil or other large quantities of medicine through a tube was urged. It was suggested that possible failure to pass tube was due to using a ten-dollar tube instead of one dollar. "Torsion of the Uterus," by Dr. E. A. Richardson, the report was read by the secretary and discussed quite freely. Successful cases of opening of abdominal walls in cattle and righting were reported.

The question of breeding cows with partial stenosis of the os at calving was discussed and negative view seemed to have the majority.

A special committee, composed of J. I. Gibson, — — Griffith and J. Dixon, to draft resolutions regarding the death of former President Dr. T. A. Shipley's son was appointed, a copy to be sent Dr. Shipley. Report accepted and committee discharged.

Dr. H. E. Talbott's talk was accepted as the Legislative Committee report. The Legislative Committee was instructed to spend up to one hundred dollars if needed to strengthen the veterinary law.

The secretary was instructed to notify each member of the association to co-operate with the committee and the Board of Examiners, through their legislators, in securing needed legislation. A vote of thanks was extended to the Pilgrim Hotel and the Commercial Club for the accommodations and courtesies extended the association. It was voted that the association hold a three-day session next November instead of the regular winter meeting.

Secretary was instructed to send registered letter to those in arrears that dues must be paid, or the penalty will be enforced.

The following were elected to membership: E. C. Scantlebury, R. E. Hanson, I. C. Brown, J. McKenzie, W. J. Cleveland, W. F. Christopher, W. H. Seright, G. R. Beavers, P. J. Hipschen, J. H. Weibel, D. B. Stewart, N. W. Rosengren, R. E. Larimer, J. M. Wilson, W. J. Embree, C. B. Riedel, H. S. Van Vranken, C. F. Beamer, A. R. Menary, J. M. Lichty, H. J. Sampson, H. D. Bergman, J. M. Newby, V. J. Smith, P. L. Talbot, V. C. Stutson, F. S. Cozzens, F. B. Copeland, R Becker, C G. Cole, C. A. Noggle, C. E. Garman, W. A. Moeller.

The rules were suspended and H. S. Murphy and W. W. Dimick were elected to membership.

It was voted to pay for the music rendered at the banquet.

A banquet was held at the Pilgrim Hotel, nearly eighty in attendance, D. M. Campbell acting as toastmaster; a number were called on for short talks, after which a question box passed and all were invited to ask at least one question. This was one of the valuable features of the meeting and a very profitable way to spend an evening.

Dr. D. M. Campbell asked a few questions about azoturia: Was the disease seen under the following conditions: A Pregnant mare, a breeding stallion, a fire horse, any horse after 10 days idleness, in a mule. Cases were reported of horses running in pasture, and one case after castration. Most of the conditions were reported as having been met with.

Election of officers resulted as follows:

President, Hal C. Simpson, Denison.

First Vice-President, C. E. Stewart, Chariton.

Second Vice-President, E. E. Howe, Des Moines.

Secretary and Treasurer, C. H. Stange, Ames.

Member Executive Committee, G. W. Blanche, Belle Plaine.

Report of the Committee on Resolutions:

Resolved, That it is with deep regret that we chronicle the loss of one of our valued and active members, occasioned by the death of O. R. Moyer, of Des Moines.

Resolved, That a copy of this resolution be spread on the records of the association and a copy be sent by the secretary to the family.

Resolved that the Iowa Veterinary Association heartily commend the splendid work of Rev. Kepford and Dr. Kime in their anti-tuberculosis campaign.

Resolved, That it is the wish of this association that the Iowa State Veterinary Examining Board be asked to make an

annual report at our meetings. (Signed) D. E. Baughman, L. U. Shipley, H. B. Treman.

HAL C. SIMPSON, *Secretary-Treasurer.*

THE VETERINARY ASSOCIATION OF MANITOBA.

(*Excerpts from revised proof sheets of the annual report.*)

The annual meeting of this association was held in the offices of the Dominion Department of Agriculture, Winnipeg, February 15, 1911. The meeting was called to order by President Dunbar, Winnipeg, thirty-two members being present at the opening of session.

After the secretary's report, Dr. J. A. Stevenson, delegate from the Manitoba Veterinary Association to the forty-seventh annual meeting of the A. V. M. A., at San Francisco, September 1910, was requested to report. His report was a most interesting one, including his trip in company with Dr. C. D. McGilvray, from Winnipeg to Seattle, where they met and joined the American Veterinary Special to San Francisco. The doctor then reviewed the entire meeting at San Francisco in a most interesting manner, with the result that he brought forcibly before the association the *importance* of attending the American Veterinary Medical Association's meetings, and did much toward stimulating a larger attendance at Toronto in August next.

Following the opening of the afternoon session was a discussion on "Hereditary Unsoundness of Stallions." Owing to the absence of Dr. Henderson, who was down on the program to open the discussion, the subject was brought before the meeting by the secretary, who read a letter received from the secretary of the Manitoba Horse Breeders' Association, asking the opinion of the Veterinary Association as to what diseases should disqualify a stallion for registration under the Horse Breeders' Act. It is needless to say that a most interesting and profitable discussion followed the introduction of this important subject, and finally seemed to centre around "Bog Spavin," which was finally summed up by Dr. Torrance as follows:

"Regarding this question of bog spavin we have got to bear in mind that it is not the queston of absolute soundness which we have to decide upon. It is a question of hereditary unsoundness. Now a horse may not be absolutely sound in the hocks so

that you would not feel that you could give a certificate of absolute soundness for the horse; but this horse might not be affected with anything you would term hereditary. Are we all of the opinion that all bog spavins are hereditary? I must confess that I am not of that opinion. A large number of horses get this condition from overexertion and if we were to throw these horses down for the reason that their hocks were filled in, or heavy, we might do a great deal of injury to the horse breeders' business. I think, myself, that we should leave bog spavin in that list of diseases, but I think every one of us should use his own judgment in examining a horse as to whether he considered a puffiness of the hock was a hereditary condition, which that particular stallion would be likely to transmit to his progeny, and if he considered that it was not, I think that stallion should be passed."

Dr. W. Manchester, of Wawanesa, then presented a paper on "Hernia in the Foal," which was warmly received and very fully discussed.

Following Dr. Manchester, Dr. Dunbar made an address on the all-important subject, "Colic," which appealed strongly to the practitioners, who discussed it from all sides. "The Use of Polybacterins," by Dr. W. E. Martin, appealed equally to the general practitioners and was very thoroughly and exhaustively discussed, the consensus of opinion being that they are a material aid in the treatment of suppurative conditions.

Dr. C. D. McGilvray then presented a paper on "Sub-Parotid Tumors In Cattle," which showed that the doctor had given the subject considerable study. A very general interest was exhibited by the members in the discussion that followed the reading of the paper. Dr. J. D. Ross, of the Federal Meat Inspection Division, next presented a paper entitled "Post Mortem Discoveries," in which he described some interesting conditions. The paper was very interesting and instructive, as also were the specimens exhibited.

The literary program was completed by an address by Dr. Torrance on "Bier's Method of Treatment of Wounds in Horses." Many questions were put to the doctor at the conclusion of his remarks, and an enthusiastic interest in the subject displayed.

The meeting was brought to a close by the annual banquet, which was held in the Manitoba Hall in the evening. In the unavoidable absence of the president, the chair was taken by the vice-president, Dr. W. R. Taylor, of Portage la Prairie, and

there were also present the following members and visitors: Dr. W. A. Dunbar, Dr. W. E. Martin, Dr. M. S. Kennedy, Dr. H. Bradshaw, Dr. F. Torrance, Dr. S. Robinson, Dr. J. A. Stevenson, Dr. C. A. Stevenson, Dr. C. D. McGilvray, Dr. W. H. T. Lee, Dr. J. Mack, Dr. J. H. Part, Dr. A. E. Williamson, Dr. W. Manchester, Dr. McLeish, Dr. B. A. Bescoby, Dr. W. Hilliard, and Drs. J. D. Ross, A. R. Walsh, J. Shonyo, F. H. Jones and R. Harrison of the Federal Meat Inspection Division.

The chairman gave the toast of "The King," which was received with musical honors, and the following toasts were also proposed and responded to:

"The Old Timers," responded to by Drs. W. A. Dunbar, F. Torrance and W. E. Martin.

"The Newer Arrivals," responded to by Drs. H. Bradshaw, M. S. Kennedy, S. Robinson and A. R. Walsh.

"Dominion Government and City Veterinarians," responded to by Dr. C. D. McGilvray, J. A. Stevenson and W. Hilliard.

"Country Practitioners," responded to by Drs. S. Robinson, J. Mack and W. Manchester.

On the motion of Dr. Kennedy, seconded by Dr. S. Robinson, a hearty vote of thanks from the country members was accorded to their city brethren for their entertainment that evening.

The toasts were interspersed with a capital selection of songs and quartettes, which were greatly appreciated, and a most enjoyable evening was spent by all present.

MINNESOTA STATE VETERINARY MEDICAL ASSOCIATION.

The fourteenth annual meeting of the Minnesota State Veterinary Medical Association was called to order by President J. P. Anderson, at the Merchants Hotel, St. Paul, Minn., January 10, 1911.

The first session, Tuesday afternoon, was given over to routine business, registration cards being used, instead of calling the roll, which system is liked best by the members.

The evening session was very interesting, Dr. A. T. Kinsley, of Kansas City, being the principal speaker.

Wednesday's sessions were very interesting, as the subject of Milk and Meat Inspection in the Eradication of Tuberculosis from the State, was thoroughly discussed and a number of

other papers on up-to-date topics by different members of the association.

Thursday's program was carried out at the University with supper there, and a very anthusiastic meeting in the evening.

The clinic conducted at Dr. Cotton's Hospital, in Minneapolis, on Friday morning, with Dr. L. A. Merillat in charge of some very interesting subjects, closed the most profitable and interesting meeting ever held in Minnesota.

At the close of the clinic, a luncheon was served at "Crombies," after which a few after-dinner talks were indulged in by members of the association, with Dr. C. A. Mack acting as toastmaster.

New officers were elected as follows:

President, C. A. Mack, Stillwater.

First Vice-President, Dr. C. J. Sigmond.

Second Vice-President, Dr. H. C. Peters.

Secretary and Treasurer, G. Ed. Leech.

The semi-annual meeting will be held at Austin, Minn., July 12 and 13, 1911.

Respectfully submitted,

DR. G. ED. LEECH, *Secretary.*

THE MASSACHUSETTS VETERINARY ASSOCIATION.

The twenty-seventh annual meeting and banquet of the Massachusetts Veterinary Association was held at Young's Hotel, Boston, Mass., April 26, 1911, forty-four members and guests being present. Dr. Madison Bunker, the president, called the meeting to order at 5.30 P. M. Minutes of last meeting were read and approved. The application for membership to the association of Dr. W. H. Broderick, of North Cambridge, was read. Other routine business being disposed of, the following officers were elected to serve for the ensuing year:

President, Dr. A. S. Cleaves, of Gardner, Mass.

First Vice-President, Dr. W. M. Simpson, Malden, Mass.

Second Vice-President, Dr. Edwd. T. Ryan, Brookline, Mass.

Secretary and Treasurer, Dr. J. H. Seale, Salem, Mass.

The secretary-treasurer's report for the year passed showed the association to be in a very satisfactory condition, both numerically and financially.

The secretary read letters of regret for inability to attend the annual banquet from Dr. W. L. Williams, of Cornell University;

Dr. R. W. Ellis, of the AMERICAN VETERINARY REVIEW; Dr. Adams, of University of Pennsylvania; Dr. E. J. Marshall, State Veterinarian, Philadelphia; Dr. J. E. Ryder, Bureau of Animal Industry, Boston; Dr. J. G. Rutherford, Veterinary Director General, Ottawa, Canada.

Following this meeting members and guests sat down to dinner, Dr. Austin Peters acting as toastmaster for the occasion.

Among the guests present were Dr. Rowley, President of the Society for the Prevention of Cruelty to Animals; Mr. Fred. F. Walker, Chief of Cattle Bureau for Massachusetts; Mr. H. C. Merwin, President Work-Horse Parade Association, Boston, all of whom were called upon by the toastmaster to speak, the speeches proving very instructive and enjoyable. Other members of the association called upon to speak were Drs. Frothingham, Maloney, Babson and President-elect Cleaves.

J. H. SEALE, *Secretary.*

MAINE VETERINARY MEDICAL ASSOCIATION.

The quarterly meeting of this association was held at the Bangor House, Bangor, at 8 P. M., April 12, 1911. The meeting was called to order by President Wescott and the following members answered to roll call: Drs. Dwinal, F. L. Russell, A. Jolly, W. L. West, C. W. Purcell, I. L. Salley, C. L. Blakely, A. L. Murch, G. F. Wescott, F. E. Freeman, H. L. Stevens, E. E. Russell, C. W. Watson, W. H. Lynch.

The minutes of the January meeting were read and approved.

The report of the Legislative Committee was favorable, there being considerable work to be done, it was not all accomplished this year.

The secretary's report for 1910 was read and accepted; there was an average attendance of fourteen members during the year, and a number of interesting papers read, which were followed by long discussions. Dr. F. E. Freeman, of Bangor, read a paper on "Punctured Wounds in the Feet." Dr. Freeman handled his subject intelligently and a long discussion followed. Our other chosen speakers of the evening were absent. It was moved and seconded that Dr. Murch, of Bangor, serve as a member of the Veterinary Examining Board. Voted to hold the next meeting at Rockland, July, 1911; papers to be read by Drs. H. L. Stevens, Jolly, Inglis and Robinson. Meeting adjourned at 10.30 P. M.

C. W. WATSON, *Secretary.*

NEWS AND ITEMS.

THE REVIEW office was honored on May 27th by a visit from Dr. and Mrs. Joseph E. Nance, returning from the Philippines. Dr. and Mrs. Nance left the Philippines, where the doctor had been in the B. A. I. service, last February, and have been traveling ever since, having been to China, through Continental Europe, Great Britain, and finally reaching New York, when they had been around the world. The doctor expects to enter private practice in the West.

THE major portion of the time at the June meeting of the Veterinary Medical Association of New York City will be devoted to the discussion of rabies. It is expected that some expert laboratory men will be present to discuss the question from that viewpoint. The meeting will be held on Wednesday evening, June 7th, at 8.30 P. M., in the lecture room of the New York-American Veterinary College, 141 W. 54th street. All are welcome; none can afford to be absent from this meeting.

The twenty-eighth annual commencement of Chicago Veterinary College took place on the evening of April 14th, in the auditorium of the Central Y. M. C. A., 153 LaSalle street, Chicago, where a splendid audience, consisting of friends, relatives and visitors, came to the exercises. One hundred and thirty-five men received the degree of Doctor of Comparative Medicine. The program consisted of an invocation, by Rev. J. Harmon Dutton, pastor of Weaver Memorial United Brethren Church, Dickens and Vidzie avenues, Chicago; president's address, by Dr. Joseph Hughes; conferring the degrees, by Dr. A. H. Baker; distribution of prizes, by Dr. Maximilian Herzog; presentation of class picture, by Dr. C. S. Renshaw; response in behalf of the faculty to presentation, by Dr. S. Merillat; vale-

dictory address by Dr. R. O. Byerum; doctorate address, by the Rev. J. Harmon Dutton. The program was interspersed with music from the Imperial Quartette of Chicago.

Dr. Hughes in his presidential address pointed out the advantages of the curriculum in the modern veterinary college to the undergraduate and complimented the class on its deportment, its studiousness and spirit while in college. Dr. Herzog presented the prizes and at the same time took occasion to amuse the audience with some humorous sallies at the expense of the recipients.

Dr. Renshaw, the president of the class, gave voice to the loyalty of the class to the college and its traditions. Dr. Merillat pointed out the lessons from college experience to be applied in every-day practical life in practice. Dr. Byerum expressed the emotions of his classmates at the hour of leaving college and bid farewell to faculty and students in behalf of the class. The Rev. J. Harmon Dutton in the doctorate address dwelt with emphasis upon four points: 1. Remember that aspiration, and not contentment, is the first law of success. 2. Remember that the elements which shall determine your success are within yourselves rather than without. 3. Choose goodness rather than greatness. 4. Do not forget to take God into account in the plan for your life:

We print below the prize winners, the honor list and the list of graduates in the class of 1911:

Prize Winners.

Highest General Average, obtained in all subjects—Gold Medal, A. F. Schrage. Anatomy—Gold Medal, E. Norton Tierney. Equine Practice—Gold Medal, A. F. Schrage; Honorable Mention, J. C. McMichael, E. Norton Tierney. Cattle Practice—Gold Medal, Wm. Madson; Honorable Mention, A. F. Schrage, E. Calldemeier. Surgery—Gold Medal, E. E. Pearson; Honorable Mention, J. T. Jennemann, E. Rosenthal. Lameness, Soundness, Shoeing and Balancing—Prize, J. P. Reynard; Honorable Mention, A. F. Schrage, E. Norton Tierney. Pathology and Bacteriology—Prize, E. Norton Tierney; Honorable Mention, C. F. Harrington, R. S. Hamilton. Meat Inspection—Prize, A. F. Schrage; Honorable Mention, E. Norton Tierney, F. Ludgate. Physiology—Prize, A. F. Schrage; Honorable Mention, E. Norton Tierney, E. E. Pearson. Materia Medica and Therapeutics—Prize, J. P. Reynard; Honorable Mention, E. Norton Tierney, A. F. Schrage. Dairy Inspection, Milk Hygiene and Medical Botany—Prize, A. F. Schrage; Honorable Mention, F. A. Kretsch, R. O. Byerum. Chemistry—Prize, A. F. Schrage; Honorable Mention, C. F. Harrington, C. H. Hart. Histology—Honors, S. L. Pilgrim, J. P. Reynard, A. F. Schrage, E. Norton Tierney. Parasitology—Prize, E. Norton Tierney; Honorable Mention, J. P. Reynard, Wm. Madson. Canine Practice—Prize, R. S. Hamilton; Honorable Mention, E. F. Karstendiek, S. L. Pilgrim. Dentistry—Prize, F. Ludgate;

Honorable Mention, A. F. Schrage, F. E. Hagy. Stock Judging—Prize, R. S. Hamilton; Honorable Mention, A. F. Schrage, B. F. Ward, Jr.

Honor List.

A. F. Schrage, E. Norton Tierney, F. M. Wilson, F. A. Kretsch, R. S. Hamilton, E. H. Bancroft, C. J. Wright, H. M. Kirk, C. F. Harrington, Wm. Madson, H. E. Horel, W. B. Holmes, L. S. Crump, H. L. Brown, E. Calldemeier, C. C. Franks, L. W. Cleland, H. E. Tyner, L. A. Dibert, B. F. Ward, Jr., S. L. Pilgrim, N. C. Wheeler.

Graduates, Session, 1910-11.

J. F. Abel, Iowa; F. C. Aiken, Wisconsin; C. N. Alkire, Wisconsin; F. E. Allen, Illinois; J. T. Alston, Mississippi; W. S. Asquith, Iowa; R. M. Bacon, Iowa; R. O. Bagley, Iowa; E. E. Bancroft, Vermont; F. J. Barker, Iowa; J. V. Bassett, Wisconsin; T. M. Bayler, New York; O. G. Beck, Illinois; R. W. Bernhardt, Illinois; L. E. Booth, Illinois; H. L. Brown, Indiana; R. O. Byerum, Colorado; E. Calldemeier, Kentucky; J. S. Campbell, Illinois; O. D. Campbell, Illinois; L. W. Cleland, Wisconsin; J. Cohn, Iowa; A. M. Conquist, Iowa; E. M. Coover, Pennsylvania; L. S. Crump, Wisconsin; A. B. Curtice, Michigan; G. R. Dafoe, Michigan; R. D. Daggett, Wisconsin; G. D. Darrah, Rhode Island; John Davies, Wisconsin; L. A. Dibert, Pensylvania; J. A. Dickie, Michigan; C. A. Dionne, Illinois; R. B. H. Drum, Illinois; I. W. Edwards, Massachusetts; W. C. Eickstaedt, Illinois; A. J. Erickson, Wisconsin; W. J. Ervin, Rhode Island; J. Roy Fauver, Illinois; E. M. Feelyater, Wisconsin; H. J. Fickensher, Illinois; F. J. Field, Illinois; H. T. Fiske, Minnesota; J. H. Forsyth, Michigan; J. H. Fowlie, Illinois; B. E. Frailey, Illinois; C. C. Franks, Minnesota; E. B. Fredine, Minnesota; L. M. Getz, Iowa; J. A. Grosskreutz, Illinois; R. C. Griffith, Ohio; N. E. Gubser, Illinois; C. A. Gurnea, Illinois; R. S. Hamilton, Michigan; C. F. Harrington, Iowa; E. A. Harris, Wisconsin; C. E. Harry, Illinois; F. E. Hagy, Illinois; C. H. Hart, Canada; A. H. Havreberg, Minnesota; L. W. Head, Illinois; N. J. A. Hederen, Illinois; K. F. Hinckley, Minnesota; Geo. Hinkley, Jr., Illinois; Geo. H. Hill, Illinois; W. O. Hilyard, Illinois; C. M. Hoard, Texas; H. E. Horel, Wisconsin; L. W. Horn, Ohio; C. F. Hobbs, Kentucky; H. H. Hobbs, Kentucky; W. B. Holmes, Virginia; Guy Hughes, Iowa; J. M. Jehle, Tennessee; J. T. Jennemann, Missouri; E. E. Johnston, Iowa; A. E. Joseph, Illinois; J. J. Jones, Nebraska; E. F. Karstendiek, Louisiana; F. M. Kearns, Indiana; H. M. Kirk, Wisconsin; F. A. Kretsch, Minnesota; V. H. Knutzen, Illinois; C. O. Kroener, Indiana; W. W. Lawson, Indiana; G. E. Lewis, Wisconsin; M. D. Loy, Kansas; Frank Ludgate, Iowa; R. J. Mackey, Kansas; Wm. Madson, Wisconsin; J. C. McMichael, Illinois; O. A. Meyer, Illinois; J. E. Meixner, Illinois; F. S. Miller, Wisconsin; G. G. Miller, Iowa; C. W. Mooberry, Illinois; John Moran, Illinois; Wm. P. Neuman, Minnesota; A. R. Nielsen Iowa; F. T. O'Brien, North Dakota; C. B. Palmer, Pennsylvania; E. E. Pearson, Minnesota; W. W. Pease, Pennsylvania; C. D. Phelps, Iowa; S. L. Pilgrim, Wisconsin; C. E. Price, California; C. F. Proper, Iowa; R. B. Raymond, Michigan; C. S. Renshaw, Iowa; Wm. F. Reynolds, New Jersey; J. P. Reynard, Iowa; R. C. Ripple, Iowa; E. Rosenthal, Wisconsin; H. J. Satorius, Illinois; A. F. Schrage, Wisconsin; E. W. Schroeder, Wisconsin; R. N. Scott, California; John Sheridan, New Jersey; E. A. Shikles, Missouri; G. F. Smith, Mississippi; C. W. Sutherland, Kentucky; F. W. Sutcliffe, Wisconsin; M. W. Tedrow, Illinois; E. N. Tierney, Kentucky; H. Tuckwood, Wisconsin; H. E. Tyner, Iowa; Wm. C. Vollstedt, Iowa; B. F. Ward, Jr., Illinois; R. R. Washer, Kansas; O. F. West, Oklahoma; N. C. Wheeler, Illinois; P. E. White, Illinois; F. M. Wilson, Iowa; F. J. Wolma, Illinois; C. J. Wright, Illinois.

VETERINARY MEDICAL ASSOCIATION MEETINGS.

In the accompanying table the data given is reported by many Secretaries as being of great value to their Associations, and it is to be regretted that some neglect to inform us of the dates and places of their meetings.

Secretaries are earnestly requested to see that their organizations are properly included in the following list :

Name of Organization.	Date of Next Meeting.	Place of Meeting.	Name and Address Secretary
Alumni Ass'n, N. Y.-A. V. C.	April 26, 1911...	141 W. 54th St.	J. F. Carey, East Orang e. N. J.
American V. M. Ass'n.	Aug. 22-25, 1911.	Toronto, Can.	C. J. Marshall, Philadel phia.
Arkansas Veterinary Ass'n.	.....	.....	Horace E. Rice, Little Rock.
Ass'n Médécale Veterinare Française "Laval".	1st and 3d Thur. of each month	Lec. Room, Laval Un'y, Mon.	J. P. A. Houde, Montreal.
B. A. I. Vet. In. A., Chicago.	2d Fri. ea. mo...	Chicago.....	H. A. Smith, Chicago, Ill.
B. A. I. Vet. In. A., So. Omaha ..	3d Mon. ea. mo.	S. Omaha, Neb	E. J. Jackson, So. Omaha.
California State V. M. Ass'n.	.....	San Francisco.	J. J. Hogarty, Oakland.
Central Canada V. Ass'n.	.....	Ottawa	A. E. James, Ottawa.
Central N. Y. Vet. Med. Ass'n.	June and Nov...	Syracuse	W. B. Switzer, Oswego.
Chicago Veterinary Society.	2d Tues. ea. mo	Chicago	D. M. Campbell Chicago.
Colorado State V. M. Ass'n.	June, 1911.....	Ft. Collins....	B. F. Kaupp, Ft. Collins.
Connecticut V. M. Ass'n.	.....	.....	B. K. Dow, Willimantic.
Genesee Valley V. M. Ass'n.	.....	.....	J. H. Taylor, Henrietta.
Georgia State V. M. A.	.....	.....	P. F. Bahnsen, Americus
Hamilton Co. (Ohio) V. A.	.....	.....	Louis P. Cook, Cincinnati.
Illinois State V. M. Ass'n.	.....	.....	J. H. Crawford, Harvard.
Indiana Veterinary Association.	.....	.....	E. M. Bronson, Indianapolis.
Iowa Veterinary Ass'n.	.....	.....	H. C. Simpson, Denison.
Kansas State V. M. Ass'n.	.....	.....	B. Rogers, Manhattan.
Kentucky V. M. Ass'n.	.....	.....	D. A. Piatt, Lexington.
Keystone V. M. Ass'n.	.....	.....	E. H. Yunker, Phila.
Louisiana State V. M. Ass'n.	.....	.....	E. P. Flower, Baton Rouge.
Maine Vet. Med. Ass'n	July, 1911.....	Rockland.....	C. W. Watson, Brunswick.
Maryland State Vet. Society.	.....	Baltimore.....	H. H. Counselman, Sec'y.
Massachusetts Vet. Ass'n.	Monthly.....	Boston.....	J. H. Seale, Salem.
Michigan State V. M. Ass'n.	.....	.....	Judson Black, Richmond.
Minnesota State V. M. Ass'n.	July 12, 13. 1911..	Austin	G. Ed. Leech, Winona.
Mississippi State V. M. Ass'n.	.....	.....	J. C. Robert, Agricultural Col.
Missouri Valley V. Ass'n.	.....	.....	Hal. C. Simpson, Denison, Ia.
Missouri Vet. Med. Ass'n	.....	.....	D. L. Luckey,
Montana State V. M. A.	.....	Helena.....	W. S. Swank, Miles City.
Nebraska V. M. Ass'n.	.....	Grand Island.	H. Jensen, Weeping Water.
New York S. V. M. Soc'y.	Sept. 12, 13, 14, 1911.....	Brooklyn	H. J. Milks, Ithaca, N. Y.
North Carolina V. M. Ass'n.	.....	.....	W. G. Chrisman, Raleigh.
North Dakota V. M. Ass'n.	Jan. 1912.....	Agricul. Col..	C. H. Babcock, New Rockford.
North-Western Ohio V. M. A.	Feb and Nov...	Lima.	A. J. Kline, Wauseon.
Ohio State V. M. Ass'n.	.....	.....	O. V. Brumley, Columbus.
Ohio Soc. of Comparative Med..	Annually	Up'r Sandusky	F. F. Sheets, Van Wert, Ohio.
Oklahoma V. M. Ass'n.	.....	.....	M. P. Hunt, Enid.
Ontario Vet. Ass'n.	.....	.....	C. H. Sweetapple, Toronto.
Passaic Co. V. M. Ass'n.	Call of Chair...	Paterson, N. J.	H. K. Berry, Paterson, N. J.
Pennsylvania State V. M. A.	.....	.....	F. H. Schneider, Phila.
Philippine V. M. A.	.....	.....	Chas. G. Thomson, Manila.
Portland Vet. Med. Ass'n.	4th Tues. ea. mo.	Portland, Ore.	Sam. B. Foster, Portland, Ore.
Province of Quebec V. M. A.	.....	Mon. and Que.	Gustave Boyer, Rigaud, P. Q.
Rhode Island V. M. Ass'n.	Jan. and June..	Providence ...	J. S. Pollard, Providence
South Carolina Ass'n of Veterinarians.	August, 1911....	Charleston....	Clarence E. Smith, Greenville.
So. Illinois V. M. and Surg. A.	Aug. 1, 2, 3, 1911.	Centralia.....	F. Hockman, Louisville.
St. Louis Soc. of Vet. Inspectors.	1st Wed. fol. the 2d Sun. ea. mo.	St. Louis.....	Wm. T. Conway, St. Louis, Mo.
Schuylkill Valley V. M. A.	June 21, 1911....	Reading.....	W. G. Huyett, Wernersville.
Soc. Vet. Alumni Univ. Penn.	.....	Philadelphia..	B. T. Woodward, Wash'n, D.C.
South Dakota V. M. A.	2d Tues. July '11	Watertown...	S. W. Allen, Watertown.
Southern Auxiliary of California State V. M. Ass'n.	Jan. Apl. Jy. Oct.	Los Angeles..	A. D. Hubbell, Los Angeles.
So. St. Joseph Ass'n of Vet. Insp..	4th Tues. ea. mo.	407 Ill. Ave....	H. R. Collins, So. St. Joseph.
Tennessee Vet. Med. Ass'n.	.....	.....	A. C. Topmiller, Murfreesboro
Texas V. M. Ass'n.	Call Exec. Com.	.....	R. P. Marsteller, College Sta.
Twin City V. M. Ass'n.	2d Thu. ea. mo .	St. P.-Minneap	S. H. Ward, St. Paul, Minn.
Vermont Vet. Med. Ass'n	.....	.....	G. T. Stevenson, Burlington.
Veterinary Ass'n of Alberta.	.....	.....	C. H. H. Sweetapple, For. Saskatchewan, Alta., Can.
Vet. Ass'n Dist. of Columbia.	3d Wed. ea. mo..	514—9th St., N. W.....	M. Page Smith, Wash., D.C.
Vet. Ass'n of Manitoba.	Not stated.....	Winnipeg.....	F. Torrance, Winnipeg.
Vet. Med. Ass'n of N. J.	July, 1911.....	N. Brunswick.	W. Herbert Lowe, Paterson.
V. M. Ass'n, New York City.	1st Wed. ea. mo.	141 W. 54th St.	R. S. MacKellar, N. Y. City.
Veterinary Practitioners' Club.	Monthly.....	Jersey City ...	A. F. Mount, Jersey City.
Virginia State V. M. Ass'n .	2d Fri. July, 1911	Norfolk.....	W. G. Chrisman, Raleigh.
Washington State Col. V. M. A ..	1st & 3d Fri. Eve.	Pullman.....	R. J. Donohue, Pullman.
Washington State V. M. A.	.....	Seattle.....	J. T. Seely, Seattle.
Western Penn. V. M. Ass'n.	1st Wed. ea. mo.	Pittsburgh....	F. Weitzell, Allegheny.
Wisconsin Soc. Vet. Grad	July 18, 19, 1911.	Green Bay....	J. P. West, Madison.
York Co. (Pa.) V. M. A.	.....	.....	E. S. Bausticker, York, Pa.

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